SOCIO-SPATIAL TRANSFORMATIONS IN THE CENTRAL COASTAL REGION OF ECUADOR BY THE INFLUENCE OF GLOBALISED TOURISM: PUERTO LOPEZ, 1990 – 2010

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To Dr Luis Vicente Pozo Tovar

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Foreword

In this doctoral research, the object of study is Puerto Lopez, a fishing town and tourist destination localised in Ecuador, South America. The study seeks to understand and discuss the nature of the social and spatial transformations related to international tourism experienced by Puerto Lopez for the last two decades. However, there is a first basic question to discuss before diving deeper into this relatively unknown world: Why do we need to take the transformations of coastal towns in the developing countries seriously?

Nowadays, the majority of the urban planning research focusses on urban areas as the main arena where the future of the humanity will be constructed and decided (Habitat, 2013). During the 21st century, climate change and peak oil effects (Hopkins, 2008), in addition to the increase of social inequality related to globalisation, will be the main challenges to tackle, especially for Latin American cities. Nevertheless, we are forgetting that rural settlements have an important role to play in this defiant future, primarily in the case of developing countries. As the result of the historically high percentage of rural families living in extreme poverty and social vulnerability, Latin American towns will suffer from the most adverse impacts of climate change, but at the same time, they will have the potential to be a strategic resource to increase resilience, even globally.

In Ecuador, the most extreme levels of poverty and vulnerability to natural disasters still concentrate in rural settlements (Wong, 2013). Towns are the main guardians and destroyers of the few biodiversity hotspots that still survive along coastal regions, which are essential for the improvement of the local and global resilience (Hannah & et al., 2013). Additionally, archaeological remains from pre-Hispanic civilisations are in danger due to the accelerated expansion of the advancing agricultural frontiers and urban borders (Lunniss, 2014). These remains had rested hidden (even invisible) from the collective view and memory of natives, due to the weak public investment in archaeological research, particularly during the second half of the 20th century, when they began to be discovered and documented (Lunniss, 2014; Bohórquez, 2012).

In the developing world, the globalised market of international ecotourism has contributed to the rapid and unplanned transformation of fishing and farming villages into small globalised cities or beach resorts. This accelerated and uncontrolled rural-urban mutation has provoked several negative impacts to the natural environment, the archaeological heritage, local identity, and the socio-economic development. In the specific case of Latin America, there are plenty of examples in the Caribbean region, Central, and South America. Punta Cana, Puerto Plata, Bahía de las Águilas, Ocho Ríos, Cancún, Acapulco, Manuel Antonio, Margarita Islands, San Andrés

Island, Baru Island, Galapagos Islands, and Santa Marta are some of the most relevant (Telfer & Sharpley, 2008; Britton, 1982).

In the case of Puerto Lopez and plenty of fishing towns along the Spondylus Route, the current Ecuadorian government (2007-2017) has invested several millions of dollars on improving tourist infrastructure and promoting ecotourism as a long-term development strategy. This strategy seeks to trigger social and economic development in rural areas as well as to leave oil dependency progressively as the main foreign currencies source (SENPLADES, 2013; Acosta, 2012). Nonetheless, there is still not a clear knowledge about the nature of the resulting socio-spatial transformations and the positive or negative impacts on the built and natural space (Pozo, et al., 2014).

This weak knowledge is the main reason why studying and planning the sustainable development of towns and rural regions in the developing world should seriously address. If international tourism continues booming and producing the acceleration of socio-spatial transformations along the Ecuadorian coastal region, these small and rustic villages will be the new medium size cities of the 2050s and a huge new and more complicated problem to solve. It results undeniable that weak urban planning in developing countries has any chance to follow these velocities of transformation to anticipate sustainable responses. The past experiences of the Caribbean and Latin American tourist towns in the 80s and 90s (now international tourism resorts) are the best examples.

Nowadays, we still have the opportunity to plan and design *the towns that we need*. Our vulnerable contemporary towns could be the resilient cities of tomorrow. This research is an academic attempt to understand what is happening in Puerto Lopez to find answers to the development dilemma of several local actors that constantly construct, destroy, and reconstruct their natural and built environment during the process of daily surviving. Despite the extreme poverty and unequal accessibility to education as a context that has shaped the majority of local lives, their close relationship to nature has given them the sensibility to understand their natural environment as well as to realise that there is something wrong with these changes. Maybe they just need more light on this foggy journey called development.

Figure 1: Native fisherman of Puerto Lopez (Photo: Pozo, 2013)

"It is true. Puerto Lopez has changed since the arrival of tourism. There are plenty of foreign people that have come from the major cities, and even from other countries, to make money here. They have earned much money thanks to tourism and our natural resources. However, we, natives and fishermen, have not perceived benefits from tourism.

We have friends that left artisanal fishing and transformed their boats into tourist boats or their houses into friendly hotels. Fishing is getting every time more difficult and a bad business for us. Twenty years ago we just took our boats, and we could fish anything we need or want from the see. It was like at home when you go and take food from a full fridge. Nowadays, we have to go out to sea to find fishes. Some people told us that the problem could be the pollution of rivers and sea. We do not know.

Additionally, we cannot compete against industrial fishing. They have huge ships and technology to find shoals easily. They just go and clear out all the fishes. What can we do? We do not want to migrate to a big city or Spain. Big cities are dangerous, expensive, and there is no possibility for me to find a job. I am too old for such an adventure! Here I have all my family, and here I want to die. Tourism is just an illusion for us, it is not a reality".

Don Eladio Luca, 62 years old, native and artisanal fisherman. Puerto Lopez, 19 January 2013 (Source: Pozo, et al., 2014; Pozo A., et al., 2014).

Figure 2: British archaeologist residing in Puerto Lopez (Photo: Pozo, 2015)

"I came just to visit. I stayed at the small square, and I was caught by some strong sensation: 'This is the place!' That night I wrote to my mother and told her: 'I think that I will stay here for several years!' I was born in London, I grew up in the countryside, in a town of 300 inhabitants; but I am fascinated by the archaeological wealth and also surprised by the fauna of the Ecuadorian coast.

However, political leaders and people seem not to appreciate the pre-Hispanic origins of this country and the natural landscape. They do not see the world from a holistic point of view. Natives do not take care and do not search about vernacular architecture as a way to create spaces that express its essential concepts. Here history should be documented. It does not exist. When I go to visit archaeological remains, my family comes with me. They learn, so they are my research group that helps me to rescue the Ecuadorian heritage.

Nowadays, politicians still deny that the history and culture of this town can produce tourism development. They still believe that natives are not able to be part of a master plan for engineering, economy, hydrology or agronomy. All this means a long process".

Richard Lunniss, 60 years old, PhD Archaeologist, University College London, University of London. Puerto Lopez, 20 April 2015 (Source: Pozo, et al., 2014; Pozo A., et al., 2014).

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Acronyms

ANCOM	Andean Community
ATP	*Área Turística Protegida*
CAGR	Compound Annual Growth Rate
DAAD	*Deutsche Akademischer Austauschdienst*
ECLAC	Economic Commission for Latin America and the Caribbean
ENSO	El Niño Southern Oscillation
ESRI	Environmental Systems Research Institute
The EU	The European Union
FDI	Foreign direct investment
GAD	*Gobierno autónomo decentralizado*
GCC	Global commodity chain
GDP	Gross domestic product
GIS	Geographical information systems
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit*
GLNP	Good Living National Plan
GNI	Gross national income
GNP	Gross national product
HDI	Human Development Index
ICTs	Information and communication technologies
ICZ	Inter Tropical Converge Zone
IEE	*Instituto Espacial Ecuatoriano*
IGM	*Instituto Geográfico Militar*
ILPES	*Instituto Latinoamericano de Planificación Económica y Social*
IMF	International Monetary Found
INPC	*Instituto Nacional de Patrimonio Cultural*
INEC	*Instituto Nacional de Estadísticas y Censos*
LAC	Latin America and the Caribbean
LDC	Less developed country
MDG	Millennium development goals
MIDUVI	*Ministerio de Desarrollo Urbano y Vivienda*
MINTUR	*Ministerio de Turismo*
MNC	Multinational company
MNP	Machalilla National Park
NGO	Non-governmental organisation
NIC	Newly industrialising countries

NPHC	National population and housing census
NUA	New Urban Agenda
OPEC	Organization of Petroleum Exporting Countries
PNBV	*Plan Nacional del Buen Vivir*
PNUD	*Programa de Naciones Unidas para el Desarrollo*
R&D	Research and development
SDG	Sustainable development goals
SENPLADES	*Secretaria Nacional de Planificación y Desarrollo*
SNAP	*Sistema Nacional de Áreas Protegidas*
SRCC	Spearman's rank correlation coefficient
SSRR	Southern Spondylus Route Region
TNC	Transnational corporation/company
T&T	Travel & Tourism
TTCI	Travel and Tourism Competitiveness Index
TTCR	Travel and Tourism Competitiveness Report
UN	United Nations
UNDP	United Nations Development Program
UNH	United Nations Habitat
WB	World Bank
WEF	World Economic Forum
WTO	World Tourism Organisation

Section A: Introductory part

1. Introduction

1.1. New tourism landscapes or tourism enclaves?

International tourism has been one of the most dynamic and growing economic sectors for the last 50 years. With a proved capacity of resilience from the economic crisis and an officially supported positive economic prediction of continuing growth during the first half of the 21st century (Schulte, 2003) (UN-WTO, 2013b), this old but healthy market has produced positive and adverse effects over the developing territories where it has landed. Nevertheless, the nature of the socio-spatial transformations of landscapes that it triggers over territories in developing countries has been less studied, even minimised.

Based on the transformationalist approach of globalisation (Held & McGrew, 1999; Jones, 2010; in Murray, 2006) and with a strong believe in the capacity of the national government and communities to manage their local sustainable development (Weiss, 2010), the study attempts to understand the nature of the socio-spatial transformations experienced during the last 20 years by tourist coastal regions and settlements with high levels of biodiversity and social vulnerability in developing countries of Latin America. It aims to contribute to the regional and urban planning, as well as the urban design of these types of regions which are strategic for the improvement of global resilience in the 21st century. The selected case study is the town of Puerto Lopez, which is located in the central coastal region of Ecuador.

The research grounds on two main facts. On the one hand, the actual international tourism market demand is guiding the Global Tourism Chains and Transnational Corporations (TNCs) to look for new *exotic* and *pristine* destinations that still survive in some developing countries around the planet. In the case of the Americas, this growth means an accelerated spreading from the Caribbean region to the South American tropical seacoasts of an enormous quantity of capital and networks with the capacity to transform territories by adverse effects like the *enclave tourism* (Britton, 1982; Madeley, 2001), but at the same time with the enormous potential to transform positively vulnerable regions in order to preserve and protect their natural and historical heritage (Schulte, 2003).

According to the World Tourism Organization (UN-WTO, 2013a), in 2012 the global tourism industry produced alone 6 billion international tourists, 9% of the global GDP, 1.3 trillion US$ in exports, 6% of world's trade, and 6% of the exports from least developed countries. Additionally, one of every eleven jobs in the world is directly or indirectly related to the tourism market (UN-WTO, 2013a). In short, tourism is a globalised economic activity with a huge

power of transforming socially, economically and physically territories around the world; no matter how remote they could be (Murray, 2006; Murray & Overton, 2015).

On the other hand, these mega-biodiverse coastal regions localised in the Tropics and Sub-tropics are strategic to improve local and global resilience against peak oil and climate change effects (Hopkins, 2008; Hannah, et al., 2013). However, they are extremely vulnerable because of their historically high levels of poverty and weak urban and regional planning during the last decades, specifically in developing countries like Ecuador (Wong, 2013).

Nowadays, these potentials and weaknesses increase the risk of destroying these biological diverse and archaeological rich regions by the fast and uncontrolled socio-spatial transformation of coastal towns like Puerto Lopez into internationalised beach resorts. Initially, the growth of tourist flows has been perceived by the majority of inhabitants as a positive fact, because of the rise of public and private investments, formal and informal job opportunities, and the creation of new global-local trade chains. Nonetheless, the climb of social inequality and the coexistence of two economic realities have demanded new answers and ideas to plan a real sustainable urban development for Puerto Lopez. The new ways of life have provoked new urban forms, without a clear knowledge about the positive or negative impacts on the natural and built environments (Pozo, Huerta, Neira, & Valencia, 2014).

By the use of the townscape analysis and the GIS technology, six types of new urban forms were identified, characterised, and evaluated regarding sustainability. The suspicion is that a dichotomy of development has spread within this region (Pozo, et al., 2014). The new vision of international and domestic tourism as a *panacea* to achieve development created two new dichotomous tourism landscapes at the same time and in the same place. One is a *virtual tourist space*, which is globally promoted by the internet and even, promoted by local and national governments. The other is a *vulnerable tourist space*, which is the consequence of the poor local inhabitants aiming to be part of the profits. This dichotomy and its physical expression in the new urban forms shaped this emerging tourism landscape, where the extreme inequality, social vulnerability, and exposure to natural disasters are undermining the possibility of a real sustainable development.

The first section (A), or *Introduction (Einleitung)*, contains three introductory chapters, which describe the structure and design of the doctoral research. In Chapter 1, the problem, the objective, and the research questions are detailed. In Chapter 2, the theoretical framework is explained as the lens to observe, analyse, and discuss the main research problem and observations. In Chapter 3, the methodology and methods defined to address the research question are defined.

The second section (B) includes two chapters that outline the *Fundamentals (Grundlagen)*, which shape and contextualize the platform on which the research is based. In Chapter 4, the evolution and actual situation of international tourism are presented on the Ecuadorian national scale. In Chapter 5, specific features of the process of geographical restructuring of the south-central coastal region or *Southern Spondylus Route Region* (SSRR) are described.

The third section (C) is named as the *Research study and results (Forschungstudie und Ergebnisse)* and houses the core of the doctoral study. It is composed of three chapters and, in general terms, contains the description of the outcomes obtained by the process of testing the methods in the specific case study. In Chapter 6, the most significant social and spatial transformations experienced by the fishing town Puerto Lopez in the last two decades are visualised. This final analytical description was made on an urban scale by census sectors. In Chapter 7, six new urban forms that shape the rapid and uncontrolled urban growth of Puerto Lopez since the arrival of tourism are characterised and demarcated. These characterisations were made by overlapping GIS information (townscape analysis), socio-economic statistics, and indicators of sustainable urban development for the period 1990 - 2010. In Chapter 8, the imminent challenges for the sustainable regional and urban planning of tourist coastal towns like Puerto Lopez are discussed.

Finally, the fourth and last section (D), titled as *Conclusion (Konklusion)* or Chapter 9*,* summarise the key findings and recommendations related to the main research question. Particularly, the main contributions of this study are emphasised.

1.2. Situation and problem

The main problem is the weak knowledge about nature (origin, causes, and effects) of the socio-spatial transformations related to international tourism in rural coastal settlements like Puerto Lopez. Regarding the recent aggressive advertising promotion of the country as an international tourist destination and the massive expected arrival of tourists and foreign investment, this problem means both a challenge and an opportunity to revert the increase of poverty, exposure, and inequality.

As well as other small towns which settle along the Ecuadorian coast, the fishing village of Puerto Lopez has experienced deep social and spatial changes since the arrival of domestic and international tourism. It seems that the continual consolidation of seaside tourism as an *economic monoculture* in the Spondylus region has produced the emergence of a new economic geography and consequently a tourism enclave. The latter reconfigured the territory and influenced, directly and indirectly, the regional and urban planning (Pozo, et al., 2014). Consequently, the structure, functions, and contents of its settlement system, cities and towns have been transformed. Especially, the last two decades have been a period of rapid urban growth and emerging of new urban forms as a consequence of the materialisation of new ways of life (Harris et al., 2004).

Since 2007, the national government led by President Rafael Correa has substantially intensified the public investment on ecotourism infrastructure and marketing as one of the key national strategies to trigger social and economic development in these historically forgotten rural regions (SENPLADES, 2013). Nevertheless, local vulnerability and extreme poverty have not been significantly reduced (Wong, 2013) and new dichotomous tourism landscapes emerged in areas like Puerto Lopez (Pozo, et al., 2014).

Although the Machalilla National Park was officially designated as a natural reserve in 1979, it was not until 2013 that Puerto Lopez has been selected to be the first pilot project of the ATP or *Área Turística Protegida* (Tourist Protected Area) national program (Gobierno del Ecuador, 2013). This official nomination meant the direct intervention of the national government and its ministries into the regional and urban planning of this region, to promote social and economic development by an aggressive plan of public investment in tourist and basic infrastructure (Gobierno del Ecuador, 2013).

Nowadays, this public initiative is probably the most critical threat to the natural and archaeological heritages which have been hidden along this coastal region for many centuries. Paradoxically, the Spondylus Route project and the ATP program are indirectly endangering the

survival of the natural and historical patrimony, which they have been promoting to preserve as a long-term national strategy for sustainable development.

Additionally, the rise of dependency of an economic monoculture (in this case tourism) could weak the capacity of resilience of human settlements. In a context of social inequality, unplanned urban growth contributes to increasing exposure to natural disasters like floods, earthquakes or tsunamis (United Nations, 2014a). Particularly, the lack of technical criteria in the design and construction of new hotels, hostels, and residential buildings in tourist towns and cities like Puerto Lopez, could mean the loss of thousands of lives and the destruction of private and public infrastructure.

On 16 April 2016, a 7.8 earthquake hit the northern coastal region of Ecuador. Several tourist towns and small cities were damaged, and hundreds of lives were lost due to the collapse of residential buildings, hostels, and hotels. This direct impact revealed the traditional vulnerability and exposure to natural disasters of rural communities in Ecuador again (Figure 3).

Figure 3: Pedernales destroyed by an earthquake in 2016 (Photo: ANDES/Micaela Ayala V., 2016[1])

Puerto Lopez was also affected, but not by the same degree of destruction than other tourist towns like Pedernales, Canoa, Mompiche, or cities like Portoviejo and Manta. However, this tragedy was an important "wake-up call" for authorities and citizens to face this problem more seriously. Tourism, within a context of deficient urban planning, informality, and

[1] Source: https://www.flickr.com/photos/agenciaandes_ec/26443589131/in/photostream/

underdevelopment, seems to weak the capacity of resilience of human settlements. Urbanisation widens the gap of social inequality and, subsequently, increase the levels of exposure to natural disasters due to the bad quality of design and construction (Pozo, et al., 2014). The official report about victims of the earthquake, which was presented on May 2016 by the national government, counted 673 deceased, nine missing, 6 thousand injured, 28 thousand affected, and 113 rescued (Figure 4).

Figure 4: Pedernales after the earthquake (Photo: ANDES/César Muñoz, 2016[2])

[2] Source: https://www.flickr.com/photos/agenciaandes_ec/26491223026/in/photostream/

1.3. Research question

The research question is the following:

What is the nature (causes, processes, and effects) of the socio-spatial transformations related to domestic and international tourism deployed during the last 20 years in Puerto Lopez?

Other complementary questions are:

- Which are the main socio-spatial transformations experienced by the Spondylus region and its settlement system since the deployment of this new economic geography?
- Which were the most important social and spatial changes experienced by the city of Puerto Lopez?
- What are the spatial, economic and social characteristics of the new types of urban forms that emerged during the last 20 years in Puerto Lopez, and how sustainable are them?
- What should be the role of the national government by its different administrative scales in these processes of change?

Behind these questions, there is a suspicion to be tested. The generalised expectation of an imminent consolidation of seaside tourism as an *economic monocult*ure and as a *panacea* to achieve development seemed to transform the economic geography of the region and has been (directly or indirectly) influencing the regional and urban planning. This phenomenon produced the emergence of two types of landscapes, which share the same *time-space* context and are also undermining the opportunity to achieve a real sustainable and resilient development (Pozo et al., 2014; Barton et al., 2013).

1.4. Main objective and sub-objectives

The main purpose is to understand the nature of the socio-spatial transformations related to international tourism in coastal regions with high levels of biodiversity and social vulnerability in developing countries of Latin America. The case study is the Ecuadorian coastal town of Puerto Lopez for the period 1990 – 2010.

Likewise, four constitutive sub-objectives support the main one:

- Observing the geographical restructuring of the Spondylus region and its settlements system.
- Describing the process of urban growth and socio-spatial transformation experienced by the city of Puerto Lopez for the last two decades.
- Identifying, characterising, and assessing the new urban forms that have emerged during the last 20 years in Puerto Lopez.
- Discussing and understanding the potential role of the national government and other local actors in these processes of social and spatial change.

2. Theoretical framework

2.1. Globalisation and socio-spatial transformations in the developing world

To understand the nature of the social and spatial transformations experienced by the Spondylus region and Puerto Lopez, it is necessary to identify and define the appropriate theoretical approach, which will support the study of this globalisation process. Since the term globalisation appeared in the scientific world in the mid-eighties, different theoretical interpretations of its nature, content, and effects have been developed (Murray, 2006). This research will address the case study of Puerto Lopez with a *transformationalist* overview of globalisation, which allows observing and evaluating the impacts based on a non-deterministic critical argument.

According to Murray (2006), contemporary writers and researchers of globalisation could be grouped in three main theoretical approaches: *hyperglobalists*, *sceptics*, and *transformationalists*. Hyperglobalists describe globalisation as an "unstoppable and all-determining juggernaut" in which "the Nation-state simply does not fit" (Ohmae, 1995 in Murray, 2006, p. 34). Sceptics define globalisation as "a strategic geopolitical project designed for the expansion of capitalism orchestrated by the dominant world power blocks" (Hirst, 1997 in Murray, 2006, p. 35) "in which the State serves as an advocate for the spread of the western empire" (Chomsky, 2001 in Murray, 2006, p. 36). Otherwise, transformationalists firmly believe in the role of the state in the land use planning to "improve the demands and effects of globalisation" (Murray, 2006, p. 41)[3].

The transformationalist approach (Held & McGrew, 1999) understands globalisation as a contemporary phase (techno-cognitive) of the capitalist system that "needs to be conceived as a powerful transformative force, which is responsible for a massive *shake-out* of societies, economies, institutions of governance and world order" (Giddens, 1996 in Jones, 2010, p. 76). It means "the widening, deepening and speeding off a worldwide interconnectedness in all aspects of contemporary social life, from the cultural to the criminal, the financial to the spiritual" (Held & McGrew, 1999, p. 2 in Jones, 2010, p. 75).

Consequently, globalisation and its effects are historical processes and products of a social construction that can be controlled and managed without a predetermined end (Held, et al., 1999 in Murray, 2006). This theoretical approach allows observing the impacts of globalisation on Puerto Lopez not as accomplished facts, but as a dynamic process of mutation feasible to be redirected by the government and by the practices of the global and local actors involved. This

[3] Held & McGrew (1999) proposed to group the main theoretical and empirical production related to globalisation in three main schools of thought: hyper-globalist, sceptic and transformationalist.

point could be better explained with the *Alter-globalisation* discourse of globalisation presented by Warwick Murray (2006) in his book *Geographies of Globalisation*:

> This view posits that the nature of globalisation is not predetermined and does not follow a given evolutionary path. Rather, it is a consequence of human actions and particular political choices. The political implications of this view are reformist; citizens and nation-states have a role to play in resisting and regulating it, and alternative and progressive globalisations are possible. As such, globalisation can yield both positive and negative outcomes depending on how it is constructed. The major task then is changing the nature of globalisation through human action – but not destroying it. A number of the groups lumped together under the –anti-globalisation- label might be more appropriately placed in this school of thought. This view is associated to a large degree with the transformationalist school of thought, and the majority of the work undertaken in human geography to date falls into this camp – although it has tended to be a little more radical than the weak or passive transformationalist view, as we will see (Murray & Overton, 2015; Murray, 2006, p. 13).

The transformationalist vein conceives the current globalisation as a human creation with the capacity of transforming the absolute, relative, and metaphorical space (Castells, 1996; Giddens, 1990 in Murray, 2006). Spatial transformations are produced by different processes of profound change on the "nature and articulation of local social networks" (Murray, 2006, p. 39). Compared to previous processes of globalisation, the information and communication technologies (ICTs) enable the restructuring of more complex chains for the dynamic global exchange of flows of goods, information, and persons (De Mattos, 2010; Ascher, 2004).

The ICTs and the new free-market economic policies alter the *time-space relationship* in different ways. While the *time-space convergence* concept raises the apparent confluence of space by reducing the travel time between places due to the progressive increase in the speed of transportation (Janelle, 1968, 1969, and 1973 in Murray, 2006), the *time-space rift* concept highlights the expansion of the range of relationships between people. They can remotely access to a wider range of spaces distributed throughout the world using the ICTs (Giddens, 1990 in Murray, 2006).

On the other hand, the concept of *time-space compression*, stated by Harvey (1992), proposes a more critical and complete overview of the hidden interests of capitalism in accelerating the process of capital return in global production relations through the popularisation of ICTs and the establishment of free market policies all over the world. For Harvey (1992) this process of *annihilating of space* through time is an innate part of the early and late capitalism.

The interaction of global-local scales in the context of globalisation has also been the source of theoretical questions: Should the contemporary world be characterised as a mosaic, a system, or a network? (Gibson-Graham, 2002, Crang, 1999, in Murray, 2006). Murray (2006) argues that the world could not be characterised without any of these approaches, as well as systems of places exist and are integrated by networks. It is, therefore, impossible to defend the dominance or the existence of only one. Murray (2006) stated, "What we have is a system composed of multiple fibre networks, characterised by containing multi-directional flows, nested in a large system (capitalist economic model), which creates a mosaic of nodes (spaces) always different from each other" (p. 52).

It is not easy to decode the nature of the changes related to the incidence of globalisation over territories, but it is definitively necessary as Warwick Murray (2006) remarks:

> Overall, then, human geography has played a role in elaborating the nature, roots and impacts of globalisation, but it has a long way to go in order to suggest the kinds of solutions that might be workable. Taylor et. al (2002) suggest that "we need to understand globalisation today, to make a better tomorrow, for all humanity" (p. 17), but we also need to understand the globalisation of yesterday in order to make historically grounded suggestions (p. 25).

Puerto Lopez and its settlements system could be considered within a mosaic tile that has been transformed by a monoculture (international tourism) established by a capitalist system which links the world through a network of streams in a global-local relationship (constant but also volatile). Different opinions emerged around these various ways of interpreting global-local interactions. The debate arises about the contemporary dominance of the *space of places* or the *space of flows* (Murray, 2006). For Castells (1996), the first one characterised the society until the seventies, but since the arrival of late globalisation, it has been gradually displaced by the latter. The transition from the *industrial age* to the *informational age* meant the loss of the value of the space (Castells, 1996).

However, the transformationalist authors defend the existence of the space of places for their importance as nodes in networks and as economic agglomerations for the transmission and reception of flows. The space of places is the spatial *fixity* or *inertia* (Dicken, 2011) that is necessary for the efficient operation of the capital (Murray, 2006). As part of this general line that defends the existence and importance of places and spaces as physical territories within the process of globalisation, the term *glocalization* emerged (Swyngedouw, 2004) to study the nature of regional changes based on the existence of a reconfiguration of scales. This phenomenon occurs due to the *territorialisation*, *de-territorialisation*, and *re-territorialisation* of the capital (Swyngedouw, 2004). They deploy in the local space by altering the geometry of

social power. Swyngedouw (2004) states, "The scalar configurations are the result of socio-spatial processes that regulate and organise social relations of power. These scales become areas or spaces around which the choreography of socio-spatial power is enacted" (p. 4).

It is precisely this process of reconfiguration of scales which stimulates the de-territorialisation, and re-territorialisation of capital flows. The main consequence is the creation of two dichotomous social groups. One is dependent, vulnerable and limited to operate within local scales. The other is a powerful local bourgeoisie that consolidated in partnership with foreign investors. The latter can jump between different local, national or global scales (Smith, 1984 in Murray, 2006). The physical consequence is the emergence of a dichotomy of development that solidifies in two new types of tourist landscapes that coexist at the same time and space.

Transnational corporations and companies (TNCs) and domestic firms (domestic capital) that locates on the territories for the extraction of resources play a major role in this dynamic. Their strategic location marks the runway for capital flows or foreign direct investment funds (FDI). The local-global enterprises generate direct and indirect employment but also transform the social networks of power. These changes mean the promotion of a social class division and a direct or indirect influence from the most powerful social groups on the spatial planning and politics to amplify their profits (Swyngedouw, 2004; Harvey, 2001).

This theoretical approach seems to respond to the socio-spatial transformations that have happened in Puerto Lopez for the last 2 decades: "A traditional community is facing a major internationalisation process that generates a socio-economic and socio-cultural transformation to a new economic culture and a new way of thinking about space and time" (Floysand & Román, 2008, p. 2). The massive migration of rural families from different villages of the region to the new tourist towns in search of unskilled jobs directly or indirectly leads to profound socio-spatial effects. Traditional farmers and fishermen, who had produced for own and local consumption for decades in close relation with the natural landscape and resources, radically changed their lifestyles and became part of a society that is characterised to be individualistic, consumerist, egotist and extremely dependent on their physical environment and the capitalist economic system (Kay, 2008).

It is a radical change that produces an initial perception of improvement regarding the quality of life and incomes. The access to benefits of a modern technology based on the reception of a regular salary produces an initial positive impact. But at the same time, they are also losing their traditional livelihoods and survival modes, which contribute to decrease their capacity of resilience and increase their vulnerability and exposure to economic crisis or natural disasters (Pozo, et al., 2014; Barton, et al., 2013; Floysand & Román, 2008; Harris et al., 2004).

They adopt a state of relative vulnerability and become dependent on tourism as a monoculture (the local-global tourism in the case of Puerto Lopez). The biggest problem for the local dependents is that this monoculture could be volatile or, in other words, able to delocalize (take out) its capital at any time and leave the territory. This situation could be triggered by an economic crisis, a natural disaster or just because foreign investors find a better place to invest and multiply profits. The latter situation is part of the dynamics of the global free market. Investors are free to select a better place to invest their money with a better range of facilities like cheaper materials or handwork, more natural resources, flexible laws, open market policies[4], and others.

These social changes provoke accelerated and transparent processes of spatial transformations in settlements (unsustainable urban growth) and the decrease of the capacity of resilience of local communities (Pozo, et al., 2014; Barton, et al., 2013; Floysand & Román, 2008). This dichotomy of development expresses itself physically in two different tourism landscapes which emerged during the last two decades. The research supposes that these urban growing patterns have been contributing to the rise of social inequality, dependency, poverty and vulnerability, instead of promoting local sustainable development and resilience (Pozo, et al., 2014).

Nevertheless, the national government has a major role to play in these processes of change. Thus globalisation "is associated with a transformation or –unbundling- of the relationship between sovereignty, territoriality and state power; thereby the power of national governments is not necessarily diminished by globalisation but is rather being reconstituted and reorganized in response to the growing complexity of processes of governance in a world which is more interconnected" (Jones, 2010, p. 77). Likewise, the research seems to discuss the opinion of authors, who consider that a well-guided globalisation process has the power to increase the value of territories (Boisier, 2005), and reinforce the local and the global scales at the same time (Kennedy, 2010).

There are several examples of deep and rapid processes of territories and natural landscapes in developing countries being transformed due to the influence of globalisation. The capacity of social, cultural, economic and physical transformation has been fuelling the creation of new landscapes around the world, which are oriented to a specific economic monoculture closely connected to the globalised market. In the case of international tourism within the Americas, the

[4] An interesting similar case study, which was the original inspiration to address the theoretical approach of the present research, is the monoculture of the international salmon industry in Chile. It has transformed the southern Chilean region for the last 30 years. After one decade of a profitable economic growth, in 2000 the ISA virus attacked the industrial production of the Chilean farmed salmon. By lowering the international demand of the commodity, the local demand for basic labour by the industrial sector also fell. This led to a rapid escalation of the unemployment rates in the urban centres of the Chiloe Island that produced subsequent social impacts (Barton, et al., 2013).

evolution of tourism enclaves has been reported by several authors since the 1980s. Cancun and Acapulco in Mexico, Punta Cana in Dominican Republic, are just some of the huge list of former "pristine long-lost Eden" Caribbean beaches, which nowadays are overcrowded seaside resorts with enormous problems of pollution, destruction of biodiversity and loss of ancient cultures (Anderson, 2011; Mowforth & Munt, 2009; Britton, 1991; Britton, 1982; Britton, 1981).

Of course, there are also positive examples of tourist destinations with sustainable processes of transformation. However, they are few, and the definition of "positive transformation" depends on the perspective and approach that each case study was observed. The UN-WTO (2012) promotes tourism as a positive force to achieve sustainable development by the implementation of a green economy like in ecotourism projects as "the NGO *Response* in Argentina, the *Yachana Lodge* in Ecuador, or the Ecotourism *Tomarapi Lodge* in Bolivia" (pp. 91-92).

The New Urban Agenda (NUA), which will be officially presented in the global conference Habitat 3 on October 2016 in Quito, is another step in the way to achieve an agreement about the priorities of sustainable and resilient global development. The new *Sustainable Development Goals* (SDGs) were agreed by national governments, institutions, and other stakeholders around the globe. Additionally, the NUA presents updated definitions of terms like sustainability and resilience, as well as methods for measuring them and monitor the compliance of the SDGs by indicators.

Nevertheless, the NUA also has generated strong reactions of scepticism and incredulity in diverse actors related directly or indirectly to the study of underdevelopment and social inequalities. The main arguments are based on the results obtained from the implementation of the last Urban Agenda 2015 since the last Habitat 2 in 1996 in Istanbul. Questions arise around goals that seem to be tough or impossible to achieve like: "Eradicate extreme poverty and hunger: Halve the proportion of people living on less than a dollar a day and those who suffer hunger" (Stiglitz, 2015 p. 284). Within the current global context where capitalism and inequality predominate, achieving this goal in poor regions that are suffering civil wars, natural disasters, or dictatorships, simply looks too far away to reach (Stiglitz, 2015).

The global goals for a sustainable development represent the main global commitments that shape the Habitat Agenda 2015 - 2030. According to UN-Habitat (2015a), it is:

> A 17-point plan to end poverty, halt climate change and fight injustice and inequality. The Global Goals are the biggest attempt in the history of the human race to make the world a better place. A plan that 193 governments have agreed on a plan that the world

> wants and needs. A plan backed by leading business and organisations. A to-do-list for the planet that will only be achieved if everyone plays their part (UN-Habitat, 2015a).

Particularly, the 11th goal (Sustainable cities and communities) seeks to "make cities and human settlements inclusive, safe, resilient, and sustainable" (UN-Habitat, 2015a). Its main targets are:

> (1) By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums; (2) By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with particular attention to the needs of those in vulnerable situations, women, and children, persons with disabilities and the elderly; (3) By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries; (4) Strengthen efforts to protect and safeguard the world's cultural and natural heritage; (5) By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses about the global gross domestic product caused by disasters, including water-related catastrophes, with a focus on protecting the poor and people in vulnerable situations; (6) By 2030, reduce the adverse per capita environmental impact of cities, including by paying particular attention to air quality and municipal and other waste management; (7) By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons, and individuals with disabilities; (8) Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning; (9) By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels; (10) Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilising local materials (United Nations, 2016, pp. 32-33).

2.2. International tourism, development, and resilience: a mirage?

Global tourism proved to be one of the most dynamic and growing economic sectors during the last 50 years. With a proved capacity of resilience against the economic crisis and officially supported positive economic predictions of continuing growing for the first half of the 21st century (UN-WTO, 2013b), this old but healthy globalised market has produced positive and adverse effects over the developing territories where it has landed. In the specific case of Ecuador, the last decade has been characterised by an intense and strong public investment in tourist infrastructure and international marketing to attract some of the flows from this enormous global market.

In particular, international tourism is positively accepted in developing countries due to its potential to generate fast economic incomes in regional and local economies by the creation of labour opportunities and the intertwining of local-global networks of commodities, services, and information (UN-WTO, 2012; Schulte, 2003). Eco-tourism is promoted as an economic activity which increases the value of natural landscapes and supports the protection of natural resources by reinforcing the global conscience about the preservation of pristine ecosystems (Schulte, 2003).

Other usually quoted benefits of international tourism in the territories are: the creation of new formal and informal workplaces; the contribution to decrease rural-urban migration; the improvement of the monetary incomes for local families; the increase of accessibility to low-skilled jobs for low income natives; the exchange of cultures, ideas, and lifestyles; the domestic and international promotion of the local identity and culture; and the improvement of local resilience against economic crises or natural disasters (UN-WTO, 2012; Schulte, 2003).

According to the World Tourism Organization (WTO) and other global foundations related to tourism and development, this economic activity promotes and fosters global-local engagements which are extremely beneficial for local economies around the world. Especially, initiatives like sustainable tourism, green tourism or conscious travel, have been discussing the potential of tourism as a global strategy to promote development in developing countries (UN-WTO, 2012).

Nonetheless, tourism is not as profitable for locals as it seems to be. According to various analyses of the global value chains related to tourism (Lessmeister, 2008; Madeley, 2001; Britton, 1982), the largest quantity of incomes and profits remains outside the territory of destination. This phenomenon is denominated as *tourism leakage* (UNEP, 2014; Madeley, 2001; Britton, 1982).

Even though the term *enclave tourism* was used in the early eighties to describe the unequal exploitation of touristic landscapes in developing countries (Britton, 1982; Mathews, 1977), it is

still quoted in recent scientific articles and studies around the world. Some examples of the developing countries are: the Okavango Delta – Botswana (Mbaiwa, 2005), Kenya (Ndubano, 2000 in Mbaiwa, 2005) and Zanzibar - Tanzania (Anderson, 2011) in south-central and east Africa; Saint Lucia, Jamaica, Dominican Republic and Barbados, in the Caribbean Islands; India, Nepal, Thailand, Philippines, Singapore, and Indonesia in Asia.

Likewise, the United Nations Environment Program (UNEP) incorporates on its website clear explanations about enclave tourism and leakage as negative impacts deployed by the tourist industry in developing territories: "A study of tourism *leakage* in Thailand estimated that 70% of all money spent by tourists ended up leaving Thailand (via foreign-owned tour operators, airlines, hotels, imported drinks, and food, and so forth). Estimates for other Third World countries range from 80% in the Caribbean to 40% in India" (UNEP, 2014).

Another common example that is used to describe the economic enclave tourism is the cruise ship industry: "Non-river cruises carried some 8.7 million international passengers in 1999. On many ships, especially in the Caribbean (the world's most popular cruise destination with 44.5% of cruise passengers), guests are encouraged to spend most of their time and money on board, and opportunities to spend in some ports are closely managed and restricted" (UNEP, 2014). In his book, *Big business, poor people, the impact of transnational corporations on the world's poor,* Madeley (2001) showed how the tourism TNCs had managed 80% of the global tourism market at the end of the 90s (Madeley, 2001).

The informality of the labour market and the volatility of global tourism chains contribute to foster the dependency and vulnerability instead of producing development (Madeley, 2001; Britton, 1991, 1982, 1981)**.** For the last 30 years, national governments of developing countries with high levels of biological diversity have been considering tourism as a *panacea* to improve social and economic development. Nevertheless, the effects of tourism in these territories seem to be more negative than positive (Mbaiwa, 2005; Madeley, 2001). In other words, the *trickle-down* theory failed, and the gap between wealthy and indigent people widened.

Joseph E. Stiglitz (2013), (Nobel Prize in Economics in 2001), in his book *The price of inequality* explains why the "myth" about celebrating the growth of markets and the enrichment of the wealthiest top minorities (elites) due to the consequent resulting benefits for middle and bottom majorities by the increase of new jobs opportunities, is not necessarily right:

> In a world of globalisation, creating market value had become entirely separated from creating employment" (Stiglitz, 2013, p. xvi). What we have seen quite clearly is that a common use of wealth is to gain an advantage in rent seeking, perpetuating inequalities through the political process. The same old "myth" that we should celebrate the richness

> of those at the top because all benefit from it has been used to justify the maintenance of low taxes on capital gains (Stiglitz, 2013, p. xvii).

Since 2007, the Ecuadorian national government has been promoting the replacement of its traditional dependency on first exportation (petroleum, agriculture, and fishing) by international tourism as the "new way to achieve local sustainable development" (SENPLADES, 2013). According to the governmental prognosis expressed in the *Good Living National Plan* (GLNP), in 2020 Ecuador will be supporting its national budget on the exportation of biological technology and ecotourism services (tertiary economic activities) (SENPLADES, 2013).

These new approaches, about nature as a limited source of resources, as well as the main product for the construction of a green local-global economy (avoiding the reproduction of a national economy based on the exportation of primary commodities), were strongly underpinned by the current Ecuadorian constitution (2008). According to the national government, it is the first constitution in Ecuador and Latin America to establish special rights for nature as a strategic national resource, which should be protected and preserved (SENPLADES, 2013; Gobierno del Ecuador, 2008). This innovation was a significant breakpoint in the history of the Ecuadorian tourism industry, which was transformed by the state strengthening of ecotourism as a national priority for development (Prieto, 2011).

Policies, programs, projects, and all the diversity of planning tools of the different territorial scales (national, sub-national, regional, provincial, urban and communal) included this national goal in their analysis and proposals. Likewise, local and foreign private investors understood this new phase as an opportunity to create more value for their products, services, and indirectly at the place. The national government has invested several millions of dollars in improving and reconstructing the main transport infrastructure (airports, ports, highways, and roads) in all regions of the Ecuadorian geography and has deployed an aggressive advertising campaign in traditional high income-tourists countries like USA, Germany, and the United Kingdom, and in new emerging massive markets like China and India (MINTUR, 2009).

The mega biologically diverse regions are strategic for the survival of the entire natural system of the planet. Definitively, their protection and preservation are global responsibilities (Hannah & et al., 2013). However, at the same time they are globally susceptible to the effects of climate change, natural disasters, economic crises, political crises, and economic monocultures, (petroleum, agricultural, manufacture, tourism or others). These vulnerabilities have been reinforced by different types of weakness, like extreme poverty, low education levels, dependency on primary economic activities, weak regional and urban planning, corruption, and others (ECLAC-UN, 2010a, 2010b).

The capacity of the national government to adapt to globalisation could be the key to guide the sustainable development of these types of tourism landscapes, as Weiss (2010) argues: "As we move into the next century, the ability of Nation-States to adapt to internationalisation (so-called *globalisation*) will continue to heighten rather than diminish national differences in state capacity and the accompanying advantages of national economic coordination" (p. 175).

Nonetheless, in the case of the Spondylus region and Puerto Lopez, the emerging and consolidation of a strong national government since 2007 did not necessarily guarantee the achievement of a sustainable urban-regional planning and the consolidation of resilient local communities. The weak knowledge in developing countries like Ecuador about the transformations and negative impacts related to rapid urban growth and globalisation is a relevant restriction for any attempt to plan real development in these types of regions and settlements (Barton, et al., 2013; Boisier, 2005).

As Barton (2013) remarks consistently in his scientific work, it is extremely necessary for developing countries to understand how the global market chains (in this case tourism) flow around the globe, how they land on territories, and how they create new types of landscapes by the deployment of transformation processes (Barton, et al., 2013). Since the beginning of the 80s until today, plenty of papers about the positive and negative impacts of international tourism (*enclave tourism*) over developing countries have been produced (Madeley, 2001; Britton, 1982; Britton, 1981; Mathews, 1977). Afterwards, several studies about the global trade chains have been developed around the world (Gereffi & Fernandez-Stark, 2011; Gereffi, 1994) to analyse the content of these global value chains and the possibility to promote local development by the same inclusion of local economic activities.

At the beginning of the 21st century, with the scientific confirmation that climate change effects are real and will be extremely destructive, the priority to improve the capacity of resilience in territories and settlements emerged frenetically (Möllers, Schwägerl, & Trischler, 2015). Additionally, the *peak oil* threat increases the urgency of rethinking our current ways of life and economic structures globally, as Hopkins (2008) emphasises:

> It is no longer just a case of whether we should be questioning the forces of economic globalisation because they are unjust, inequitable or a rapacious destroyer of environment or cultures. Instead, it is about looking to the *Achilles heel* of economic globalisation, one from which there is no protection other than resilience: in a degree of oil dependency. The very notion of economic globalisation was only made possible by cheap liquid fossil fuels, and there is no adequate substitute for those on the scale we use them. The move towards more localised energy-efficient and productive living arrangements is not a choice; it is an inevitable direction for humanity (p. 14).

The scientific proposal about the arrival of a new geological age, unofficially named as the *Anthropocene* by Crutzen & Stoermer (2000), has been becoming stronger for the last decade (Waters & et al., 2016; Möllers, et al., 2015; Hopkins, 2008). However, the global reaction in different scales has been slow and not necessarily efficient. In developing countries like Ecuador, it seems not to be addressed wisely. The promoted governmental attempts to transform the national productive matrix into a green economy appear to contradict their selves with a strong *extractive* economy, which still depends on non-renewable resources, specifically petroleum (Acosta, 2012). As a developing country and oil-producer nation, Ecuador is doubly fettered to the global oil dependency. This fact contradicts completely the *transition* concept from Hopkins (2008), who firmly believes in the *resilience-building* argument, "… in our current (and long overdue) efforts to drastically cut carbon emissions, we must also give equal importance to the building, or more accurately to the rebuilding, of resilience. Indeed, I will argue that cutting emissions without resilience-building is ultimately futile" (p. 12).

Likewise, Richard Heinberg, from the Post Carbon Institute of California, adds in the foreword of the Hopkins's handbook (2008) a direct and strong message that does not leave room for doubt about the importance of constructing bottom-up resilience around the planet:

> Fossil fuel depletion might be seen as a good thing, given the horrific environmental costs of using those fuels. But our societal dependencies on oil, coal, and gas constitute an enormous collective vulnerability since there are no ready substitutes capable of fully replicating their services. Thus as fossil fuels go into decline; we will see a century of contraction in consumption levels that could cause the global economy to implode, undermining the survival prospects for the next generation. Unless we wean ourselves from these fuels proactively, societal support systems will crash just as the global climate gets pushed past a tipping point beyond which there will be nothing humans can do to avert worst-case impacts including sharply rising sea levels and devastated crops. Depletion and climate issues converge to make a deliberate, cooperative transition away from fossil fuels the centrepiece of our human survival strategy for the remainder of the 21st century (p. 9).

The Ecuadorian government, like other Andean countries traditionally affected by natural disasters like floods (*El Niño* or ENSO phenomenon), droughts (*La Niña*), earthquakes, tsunamis, and volcanic eruptions, has increased its capacity of reaction against the crisis and improved mitigation processes during the last decade. Nevertheless, there is not a clear evidence of strengthening the local resilience capabilities, particularly in poor and vulnerable rural regions like Puerto Lopez (Pozo, et al., 2014). During the years 2014 and 2015, several types of natural disasters revealed the low capacity of resilience in rural poor communities. Million

dollars losses in agriculture, aquaculture, ranching, public infrastructure, and private goods like houses, cars, boats and tractors, are just some outcomes of the high levels of exposure and vulnerability from rural regions in Ecuador.

The volcanic activity in Highlands, floods and landslides in the coastal area, are common threats that tested the Ecuadorian state and local governments every year. For 2016, the strongest ENSO of all the time is expected to arrive. Enormous and expensive emergency programs are going to be activated. Nevertheless, the background problem has not been still solved. The extreme poverty and inequality, informal urban growth, deficient quality of construction by the informal housing, high levels of vulnerability and exposure, are yet part of the dichotomous development of cities and towns along the rural coastal region (Wong, 2013; Arriaga, 2000).

Official statistics of the periods 1990-2001 and 2001-2010 describe a discrete decrease in extreme poverty, physical vulnerability and informality in the Ecuadorian coastal region (Wong, 2013; INEC, 2010, 2001, 1990). The rise of social inequalities and the expansion of informal urban growth have ramped up exponentially and massively the exposure to natural and man-made hazards; which means a weak resilience capacity of local communities. Thus, understanding the nature of the socio-spatial transformations triggered directly or indirectly by international tourism in small coastal towns as Puerto Lopez, could be a first step to protect the natural and archaeological heritage by promoting resilience locally and globally (Lunniss, 2014; Hannah & et al. 2013; Acosta, 2012; Hopkins, 2008).

In 2016, the exhibition *Welcome to the Anthropocene - The Earth in Our Hands,* presented by the *Deutsches Museum* in Munich with the support of the *Rachel Carlson Centre* and the *Ludwig-Maximilian University*, offered a complete overview of the concept *Anthropocene*. The objective was to provoke the observers to think deeply about the "complexity of human influence on the Earth and how this is reflected (positively and negatively) in the urban development, mobility, energy, climate, food, nature, and global justice" (Möllers, et al., 2015). The message was direct and definite: The future of the Earth, our planet, is still in our hands. In other words, each of us, no matter our ethnicity, ideological thinking, religion, education level, skill or labour activity, are responsible for the future of our big common but unique house (Möllers, et al., 2015; Hopkins, 2008).

Despite of the fact that this message could sound "eroded" due to its intensive repetition and the lack of deep changes in the international globalised oil-dependent economy, the term Anthropocene as a new geological age provoked by the human traces over the earth (Waters & et al., 2016) focussed on a bottom-up approach in which every human way of life and consumption pattern has the potentiality to contribute positively or negatively. These arguments

nurture a global hope that each person has the power to change the apocalyptical scenarios expected by the effects of climate change and peak oil.

However, amending the ways of life around the world is not easy, particularly in developing countries. Technologies are not cheap, and extreme poverty could dilute any local initiative to prompt sustainable development in urban and rural areas. By living in extreme poverty and vulnerability, the poor citizen is more focussed on surviving and providing food, education, and security to his or her family, instead of thinking about global problems like climate change or peak oil. Thus, short-term surviving by the support of the informal labour market is a priority inside poor homes. On the contrary, long-term resilience is not considered as a priority by the majority (Pozo, et al., 2014; United Nations, 2014b).

There is plenty of evidence that supports this argument around the developing world. The development of low income housing in a location with high levels of exposure to natural disasters is one that has been shaping the slums of several urban agglomerations in the 20th century. Despite suffering from the impacts of natural disasters and losing their houses, properties and even parents, the majority of low income families come back to the destroyed place to continue their living due to their missing economic possibility to find other places. The exposure to natural disasters and vulnerability are not new, in fact, they are part of the ways of life of low income families in the developing world (Hallegatte & et.al., 2016). That is why any proposal to improve the capacity of resilience in poor urban areas should be addressed with a deep knowledge of the diversity of dynamics and problems that shape every built and social space.

By paraphrasing Hopkins (2008), “Cutting emissions without resilience-building is ultimately futile” (p. 12). It would be not enough in the case of poor contexts within the developing world. Before cutting CO_2 emissions would be a greater priority to rethink the way of ending up poverty and vulnerability locally. There is no possibility to improve the capacity of resilience in poor communities if the main conditions of poverty, i.e. the lack of education, health insurance, property insurance, regular jobs, and others are not adequately addressed.

From this point of view, international tourism could be a booster or a destroyer of resilience in poor communities, as well as of natural landscapes and archaeological heritage that still survive in territories like the Spondylus region and Puerto Lopez. Nevertheless, the local capacity to understand and control these processes of social and spatial transformations would be crucial to trigger sustainable and resilient development. Despite the economic power and volatility of the globalised markets, the last word about development still seems to be from local stakeholders, and particularly from the local governments and communities of the third world (Boisier, 2005; Harvey, 2001).

2.3. Urban morphology, townscape analysis, and sustainable urban growth

Urban morphology, as a discipline, has been selected to be part of the theoretical framework to build a methodology that could provide a quantitative method to observe, measure, and understand the nature of the social and spatial transformations experienced in the town of Puerto Lopez. As mentioned before, the main goal is to understand the nature (causes, consequences, impacts) of the rapid and uncontrolled urban growth triggered by the predominance of tourism as the main economic activity along the coastal region. To address this challenge, it is necessary to identify and characterise the new urban forms that emerged since the arrival of international tourism and to measure the quality of these forms regarding sustainability and their contribution to increasing the collective capacity of resilience.

Despite the several interpretations and applications of urban morphology that have been used by diverse disciplines around the world since the end of the 19th century, the simplest definition still seems to be the best to describe its complexity. Urban morphology refers to "the study of the form of human settlements, and the process of their formation and transformation" (Kropf, 2014). In fact, the definition of morphogenesis by human geography contains a similar meaning regarding combining spatial change and time: "the study of change in form over time" (Gregory, 2009, p. 480). Nevertheless, its long and dissimilar evolution as a discipline from different no-language-interconnected schools of knowledge, countries, and disciplines, requires a specification about the vein that shapes it.

Cities, or built spaces, are diverse and complex (Jacobs, 1967 in Kropf, 2014). Nevertheless, there is a special order that characterises this disorder or chaos. The study of the urban form is an attempt from the human logic to understand this disorder and its relations with the economic, political and social contexts by the process of abstraction and simplification of urban patterns (Kropf, 2014). Karl Kropf (2014) explains it as one of the most important roles of this discipline, which seeks:

> …to identify the repeating patterns in the structure, formation, and transformation of the built environment to help comprehend how the elements work together, notably to meet human needs and accommodate human culture. The abstraction of these patterns involves several kinds of simplification. To retain analytical rigour, it is important to identify distinct aspects and seek patterns within a simple aspect (just as the rhyming scheme is only one aspect of a poem) to understand better how the aspects interact (p. 41).

Urban morphology is not a new discipline. It has been directly and indirectly related to several technical proposals from the fields of geography, architecture, archaeology, urban planning and urban design since the 19th century (Wheeler, 2008; Gauthiez, 2004). Nevertheless, its relevance

has increased for the last decades as a supporter of the theoretical frameworks and methodologies of scientific studies, which seek to read the spatial and social transformations in human settlements by the process of urban growth in a globalised context. Following this paragraph, a general description of the evolution of urban morphology will be presented from the geographical and urban planning points of view.

In the Dictionary of Human Geography (Gregory, 2009) the term *urban morphology* is not described as a discipline or sub-discipline of human geography. Instead, the words *morphogenesis* and *morphology* are detailed, morphogenesis being: "The study of change in form over time. The term derives from developmental biology and is sometimes used as a synonym for positive feedback in systems analysis (complexity theory). Its most developed use in human geography to date has been in studies of the landscape change in historical geography" (p. 480).

Morphology is defined as the "Form, or the study of form" (Gregory, 2009, p. 480). The end of the 19th century is remarked as the breakpoint when this term became for the first time discussed between human geographers and the rising sociologists. Their theoretical representatives, *Paul Vidal de la Blache* and *Émile Durkheim* respectively, put over the table the requirement of a deeper deliberation about the connections between these disciplines. For Durkheim, "…the systematicity of the social – and thus what made its scientific study possible – was the result of its morphology, by which he meant the spatial forms through which individuals were held together as a social structure. For this reason, any account of the constitution of social life would have to include many of the propositions of human geography…" (Gregory, 2009, p. 480). The term *social morphology* was subsequently developed by other 20th century sociologists like Halbwachs and Simmel. On the contrary, Vidal refused Durkheim's statements arguing the lack of a physical-ecological dimension, which "left society suspended in the air" (Gregory, 2009, p. 480).

Afterwards, other proposals of rethinking the role of morphology in the study of the landscape by geography have been formulated. Carl Sauer, based on the previous ideas developed by Johann Wolfgang von Goethe in the 18th century about the *science of forms*, argued that: (1) "the morphology of landscape was the central object of geographical enquiry, (2) nature and culture had to be seen as interdependent in the co-production of landscapes, and (3) the same basic forms recurred across the whole field of transformations" (Gregory, 2009, p. 480). In general terms, Sauer claimed for a morphogenesis of the landscape in the context of a historical geography, where the landscape is a "generalisation derived from the observation of individual scenes" (Gregory, 2009, p. 480).

For the second half of the 20th century, morphogenesis (the study of forms over time) expanded successfully in the discipline of geography. This development can be observed in the evolution from the first qualitative and historical-descriptive studies of urban forms (M.R.G. Conzen, Whitehand, and others) to the contemporary quantitative studies that allow measuring (metrological analysis) and assessing them to test diverse features. The development of GIS technologies contributed to foster the latter with the incorporation of innovative proposals like space syntax (Gregory, 2009).

In the field of urban planning, the study of the urban form is grouped into two main traditions: "*the normative-visionary* and the *historical-descriptive*" (Wheeler, 2008, p. 401). While the first has been "aimed at developing ideal types of form," the latter has been "chronicling a wide variety of built morphologies throughout history" (p. 401).

On the one hand, the normative-visionary tradition gathers utopian theoretical proposals, which seek to find the ideal urban form. These first proposals emerged in Europe as a consequence of the extreme levels of pollution, overcrowding and deplorable sanitary conditions of the nineteenth-century Victorian cities (Hall P., 2002). At the same time, this tradition divides itself into two main currents:

(1) The first aimed to find new hybrid alternatives outside the urban agglomerations with a better quality of life and community development like: the Garden City and New Towns from Ebenezer Howard; the entirely new designed global capitals (Le Corbusier's Canberra, Niemeyer's Brasilia, and others); and the concept of *eco-villages* (Wheeler, 2008).
(2) The second current proposes to improve the built space instead of leaving it. The *hygienic city*, *new urbanism* and *smart growth* are the most representatives.

On the other hand, the historical-descriptive tradition comprises two subgroups of studies: the *qualitative-historicist* and the *quantitative-taxonomic*. As mentioned above, in 20th century geography urban morphology evolved from the initial historical and descriptive studies of the transformation of towns and cities over time and the identification of typologies (morphogenesis) (M.R.G. Conzen, Whitehand), to quantitative and taxonomic studies that measure and evaluated diverse phenomena in the urban forms by the use of GIS technologies, spatial analysis tools and virtual models of cities like space syntax by Bill Hillier, or city models by Michael Batty (Gauthier & Gilliland, 2006; Gauthiez, 2004).

The International Seminar of Urban Form (ISUF) is a European initiative created in 1994, which seeks to gather the diverse schools of urban morphology in a joint space to improve the communication and exchange of knowledge between each other. The German (Fritz, Kretzschmar, Strahm, Keyser), Italian (Muratori, Caniggia, Maffei), French (Lavedan,

Roncayolo, Rouleau) and English (M.R.G.Conzen, Whitehand) schools were integrated to discuss their theoretical positions, identify bridges between each other, and to motivate researchers and practitioners to study the built environment around the world (Kropf, 2014).

In 1997, Anne Vernez Moudon (1997) displayed the core motivations and goals that fuelled the creation of the ISUF in the first number of the *Journal of Urban Morphology*. She emphasised the need to foster the interdisciplinary nature of this emerging field, especially the relation between geography, architecture, and urban planning, as well as the role of urban morphologists:

> Urban Morphology is the study of the city as human habitat. They (urban morphologists) analyse a city's evolution from its formative years to its subsequent transformations, identifying and dissecting its various components. Urban morphologists focus on the tangible results of social and economic forces: the study the outcomes of ideas and intentions as they take shape on the ground and mould our cities (Vernez Moudon, 1997, p. 3).

The initiative was led by the research group of urban form in the Institute of Geography of the University of Birmingham. Their theoretical basis was founded on the seminal research by M.R.G. Conzen (1907-2000) about town-plan analysis. The German-born geographer focussed on a rigorous approach to townscape analysis by identifying "three main townscape elements: (1) the town plan (within which the other two were largely constrained), (2) the land-use units, and (3) the built forms" (Gregory, 2009, p. 764).

According to the Dictionary of Human Geography (Gregory, 2009), the definition of townscape is "the observable units of urban form that can be mapped and classified" (Gregory, 2009, p. 764). Kropf (2014) emphasises the role of urban morphology which is "to identify the repeating patterns in the structure, formation, and transformation of the built environment to help comprehend how the elements work together, notably to meet human needs and accommodate human culture" (p. 41).

Despite that, it could be perceived as a contemporary methodology to understand the built environment in the urban design field, for the urban geography, this term is not new and has experienced a long development since the end of the 19th century (Gauthier & Gilliland, 2006). Initially, it has been addressed by urban geography as the study of the morphology or "the patterns of land use and built form (such as streets layouts and building heights), and the processes underpinning their evolution – with little reference to their visual appearance in the landscape" (Gregory, 2009, p. 764).

With the increase of global-local threats due to the impacts of climate change (natural disasters, food crisis), economic crisis, wars and social conflicts, globalisation, and others the study of the urban form in the built environment allows researchers to observe and understand the nature of these changes. In the case of this research, the analysis of the new urban forms, which emerged since the arrival of tourism to the Spondylus region, will afford the measurement and evaluation of sustainability and resilience in the accelerated growth process of towns and villages.

The interest to study the urban forms has increased year by year over the last two decades. The accelerated processes of urbanisation and their complexity around the world fostered the formation of new research groups from developed and developing countries. One of M.R.G. Conzen's most valuable legacies to the development of the study of the urban form is the *townscape analysis* method. Even if it had been orientated in the beginning to the study of medieval towns in the United Kingdom and Europe, it has been extended to other geographical areas like Asia (China), Eastern Europe (Greece, Turkey), and South America (Brazil) over the last decades.

Nowadays, the convergence of two broad dynamics, i.e. the emergence of new economic geographies in developing countries related to globalisation and the looming threat of climate change and peak oil effects on vulnerable families (Hopkins, 2008), requires a deeper analysis about the sustainability and resilience of the new built environments that are constructed, destroyed and re-constructed by the globalised market (Harvey, 2001; Harvey, 1992). The study of the new urban forms created by the processes of urban growth and populating settlements has recovered more importance. Nevertheless, there is much work to do in the regional and urban planning of developing countries like Ecuador where natural urban growth, extreme poverty, and vulnerability are predominant (Habitat, 2013; De Mattos, 2010).

What we know for a fact is that human settlements, no matter size or hierarchy in the globalised economic network, will definitively play a strategic role in the improvement or deterioration of the quality of life of inhabitants all over the world, as UN-Habitat details:

> Cities are critical drivers of development and poverty reduction in both urban and rural areas, as they concentrate much of the national economic activity, government, commerce and transportation, and provide crucial links with the countryside, between cities, and across international borders. Urban living is often associated with higher levels of literacy and education, better health, greater access to social services, and enhanced opportunities for cultural and political participation (United Nations, 2014b, p. 3).

Urbanisation has been the focus of planetary discussions for the second half of the 20th century, and it will be for sure for the modern 21st century. New scientific and empiric approaches are

required to organise a common reaction against the diverse types of challenges that our same economic growth as civilisation has been presenting:

> Sustainable urbanisation requires that cities generate better income and employment opportunities, expand the necessary infrastructure for water and sanitation, energy, transportation, information, and communications; ensure equal access to services; reduce the number of people living in slums; and preserve the natural assets within the city and surrounding areas (United Nations, 2014b, p. 17).

Particularly, informal urban growth still represents a huge challenge for cities in developing regions and countries. Despite the positive advances on improving access to basic services and infrastructure, there is still much work to do. The implications of this phenomenon on the sustainable development of urban systems have been recognized as a major task to achieve by urban planning, but moreover by local actors and their ways of life:

> Rapid and unplanned urban growth threaten sustainable development when the necessary infrastructure is not developed or when policies are not implemented to ensure that the benefits of city life are equitable shared. Today, despite the comparative advantage of cities, social inequality is higher in urban areas than in the countryside, and hundreds of millions of the world's urban poor live in sub-standard conditions. In some cities, unplanned or inadequately managed urban expansion leads to rapid sprawl, pollution, and environmental degradation, together with unsustainable production and consumption patterns (United Nations, 2014b, p. 3).

The study of the urban form and its evolution within specific economic, social, and political contexts experienced by settlements, represent another important scientific contribution with a significant potential for the generation of knowledge about how cities grow and transform. New tools and methods, combined with advanced technology, can make the difference regarding measuring, monitoring, and planing urban growth in the developing world.

3. Methodology

3.1. Definition of methodology

The definition of methodology that was considered by the research is the following:

> The methodology should not be confused with methods: It is the conceptual rationale for which methods are used, and how. Methodology brings together and links the underlying philosophical and conceptual basis of a study of appropriate techniques. Suitable methodologies thus align the ontology of a study, how it conceives of the world, with its epistemology, how it claims to know things about the world. This is more than, though it includes, competently using one or more research *techniques*. The methodology is a meta-level issue about fitting techniques to research questions, rather than simply learning a method (Gregory, 2009, p. 457).

3.2. Type of research

The research is a quantitative-qualitative, historic-descriptive study (Hernández Sampieri, Fernández-Collado, and Batista Lucio, 2006), which seeks to understand and discuss the nature[5] and sustainability of the socio-spatial transformations experienced by the town of Puerto Lopez during the last 20 years. The methodology is based on the transformationalist approach of globalisation, which understands it as a human-created phenomenon that can transform the social and spatial space of settlements (Murray & Overton, 2015; Murray, 2006).

These physical and social transformations are explained by specific subsequent processes that are closely interconnected with the change of the economic geography caused by globalisation (Swyngedouw, 2004). In communities of the developing world, the latter produces the mutation to new urban ways of life that provoke spatial metamorphoses in settlements (new urban growth patterns and urban forms). The aim of this study is to identify, observe, and characterise these transformations to assess their contribution to improving sustainability and resilience in communities.

Thus, the research comprises both a quantitative and a qualitative approach to constructing its methodology. On the one hand, it measures and evaluates the sustainability of the urban growth of Puerto Lopez by combining geographical and statistical information with townscape analysis and indicators of sustainable urban development in the first descriptive part.

On the other hand, it incorporates the value of qualitative research by including semi-structured interviews with diverse local and global actors to understand their convergent and divergent

[5] The study understands the term nature as "the essence or defining property of something" (Gregory, 2009, p. 492).

points of view. Particularly, their understanding and reading of the newly emerging social and physical spaces were collected to be correlated with secondary and primary information.

Finally, it is important to remark that the process of research is sequential, deductive, probationary, and analyses the impartial reality (Hernández Sampieri, et al., 2006). The study combines quantitative and qualitative research, but it has not a linear sequence regarding research processes. It is composed of four main interdependent phases, each of them with a different objective, methods and scale of analysis. Nevertheless, they are tied to a common research question, which seeks to explain the process of social and spatial transformation experienced by the Spondylus region and Puerto Lopez for the last two decades. The outcomes and observations obtained by each phase allow the reader to interpret the reality by a clearer and holistic view.

3.3. The object of study

The specific area of study is demarcated by the current urban border (2010). With 9,854 inhabitants and approximately 384.46 hectares (3.84 square kilometres) (INEC, 2010), it is the capital city of the canton and the most populated and largest human settlement (Figure 5).

Figure 5: Orthophoto of the town Puerto Lopez in 2010 (Source: Own draft, 2016)

The census sectors were selected as the smallest geographical scale to observe and characterise the urban development of Puerto Lopez. In 2010, the city of Puerto Lopez was constituted by 36 neighbourhoods dispersed into 18 sectors (Figure 6).

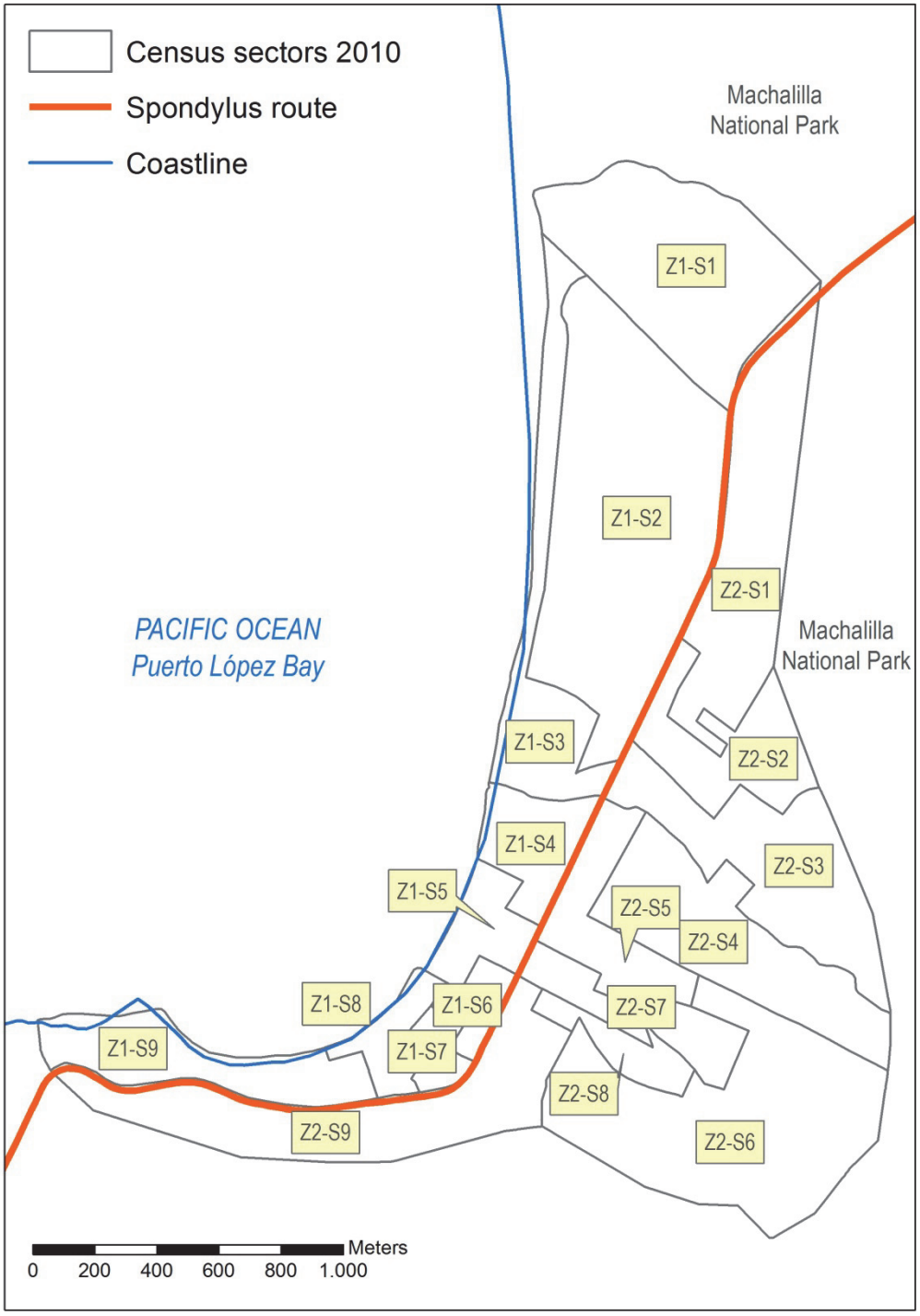


Figure 6: Urban sectors Puerto Lopez 2010 (Source: Own draft, 2016)

Puerto Lopez comprised a total of 2,839 houses in 2010. However, just 2,403 units of houses were considered for the statistical analysis. This quantity corresponds to the definition: *single*

private houses occupied by present inhabitants when the census was realised (INEC, 2010). Houses without occupants, abandoned, or under construction were not included.

3.4. Methodology and methods

3.4.1. Townscape analysis (quantitative)

In this study, townscape analysis (Kropf, 2014; Conzen, 2004) has been employed to identify and classify the new urban forms that emerged since the consolidation of international tourism as one of the main economic activities in the region. The objective was to observe and measure the sustainability of the urban growth in its most disaggregated form, to generate the material to fuel the scientific discussion suggested by the research question.

The criterion to identify the urban forms is based on the main townscape elements defined by M.R.G. Conzen (1969): "the town plan (in which the other two were largely comprised), the land-use units and the built form" (Gregory, 2009, p. 764). By the use of GIS technology, changes in the land-use and built form were identified for the period of rapid urban growth between 1990 and 2010. Additionally, socio-economic statistical information provided by the National Census of Population and Housing for years 1990, 2001 and 2010 has been mapped and overlapped to complement the whole characterisation.

The following elements, which shape the built form, were considered by the townscape analysis: street patterns (block series), plot patterns, and building patterns (Conzen, 2004). In contrast to the methodology developed by Caniggia and Maffey, other elements like "pertinent strips, rooms, structure and materials" (Kropf, 2014, p. 46) were not incorporated. The main reason not to detail and disaggregate the urban forms into such levels was the lack of information. Nevertheless, features about the quality of the buildings in term of construction materials, construction quality, and exposure were included.

Six new urban forms were identified, classified, characterised, and grouped by the similarities of their social and spatial features. Likewise, the new urban forms were evaluated regarding urban sustainability and resilience by the implementation of urban indicators. Concerning the knowledge about the quality and the sustainability of each form, these puzzle pieces were reassembled to characterise the process of rapid and uncontrolled urban growth. Particularly, severe impacts on the natural and archaeological heritage as well as on the quality of the life of natives and visitors were identified and discussed.

3.4.2. Sources of statistical and geographical information

The following sources of statistical and geographical information have been consulted to elaborate the cartography and spatial analysis required for the different processes of identification, analysis, characterization, and evaluation of the urban forms (Figure 7):

- National Census of Population and Housing (1990, 2001 and 2010).
- Economic Census 2010.
- *Plan de Desarrollo y Ordenamiento Territorial,* Puerto Lopez 2012.
- *Plan de Desarrollo y Ordenamiento Territorial,* Puerto Lopez 2015.
- IEE, Project *Generación de geoinformación del Ecuador*, 2012.
- Puerto Lopez orthophoto 2010.
- Puerto Lopez census map 2010 (INEC).
- Puerto Lopez census map 1990 (INEC).
- Google Earth images, 2003, 2006, 2012, and 2014.
- Puerto Lopez shape files and Geodatabase, SENPLADES (2010).

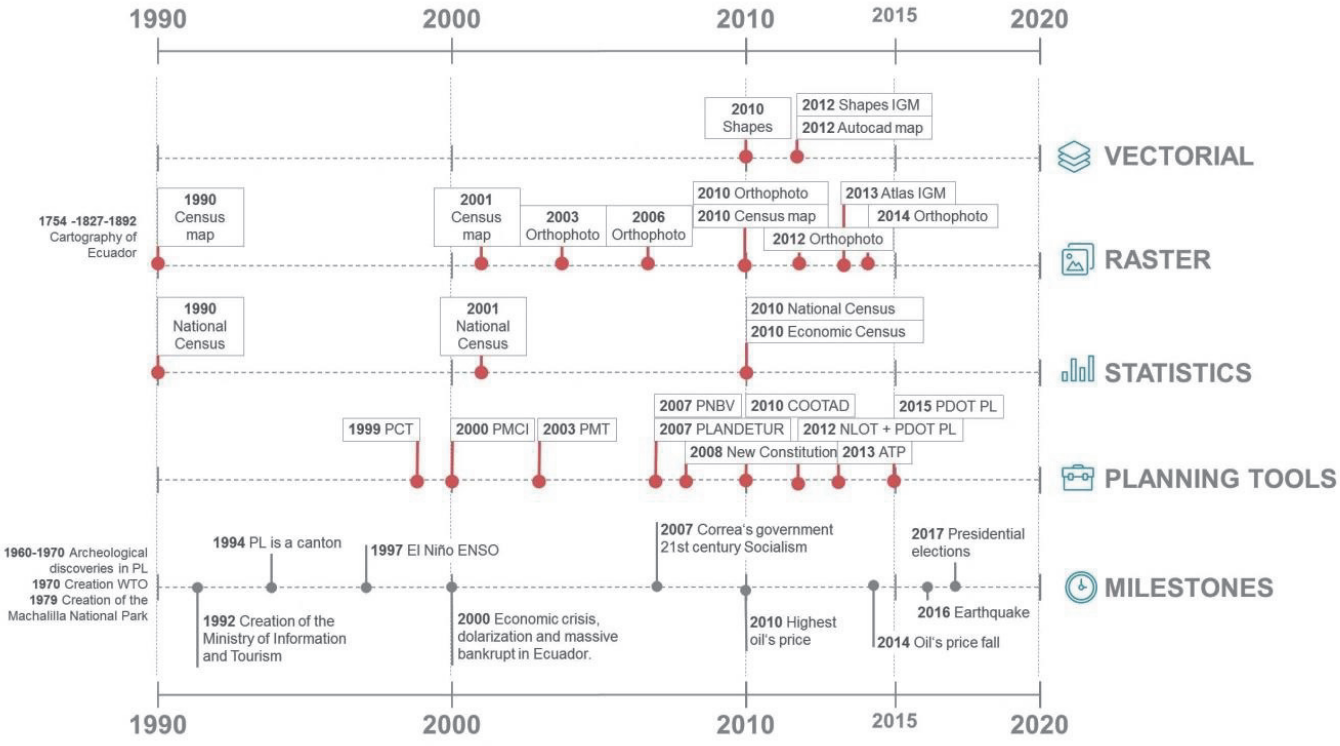


Figure 7: Main secondary information sources (Source: Own draft, 2016)

The statistical data required to characterise the urban forms was provided by the Ecuadorian National Institute of Statistics and Census – *Instituto Nacional de Estadísticas y Censos* (INEC). Likewise, raster and vectorial geographical information like maps, orthophotos, shapes and

studies about Puerto Lopez were supplied by the SENPLADES (4th zone) and the Municipality of Puerto Lopez.

The statistical information was split down to urban sectors, which is the smallest geographical scale of the 1990, 2001, and 2010 Ecuadorian national censuses. This sectorial subdivision of urban areas has been applied by the *National Institute of Statistics and Census* (INEC) to plan and implement the collection of statistical information in settlements. Urban sectors are not political or administrative geographical areas. The criterion to delimitate them was based on a number of buildings and inhabitants, which correspond to functional and logistical requirements of the national censuses. Each sector has an average number of houses and buildings between 100 and 250, and around 300 to 500 inhabitants.

No.	1990		2001		2010	
1	Z-1	S-1	Z-1	S-1	Z-1	S-1
2		S-2		S-2		S-2
3		S-3		S-3		S-3
4		S-4		S-4		S-4
5		S-5		S-5		S-5
6		S-6		S-6		S-6
7		S-7		S-7		S-7
8		S-8	Z-2	S-1	Z-2	S-8
9				S-2		S-9
10				S-3		S-1
11				S-4		S-2
12				S-5		S-3
13				S-6		S-4
14				S-7		S-5
15						S-6
16						S-7
17						S-8
18						S-9

Table 1: Census zones and sectors 1990, 2001, and 2010 (Source: Own draft, 2016)

The correspondence between statistical information of the censuses 2001 and 2010 was elaborated according to an official table of correspondence between census sectors 2001 – 2010 in Puerto Lopez, which was provided by the INEC. The correspondence between the sectorial information of the years 1990 and 2001 was elaborated according to a proportional subdivision of surface and population comparing and overlapping a census map of 1990 and imagery from Google Earth of the year 2003. The current sector structure (2010) was used as the control data or scale from which the other sectorial statistical information was adapted.

Other secondary information sources related to tourism statistics were:

- *Plan Nacional de Turismo* or National Tourism Plan, (PLANDETUR, 2007).
- Ministry of Tourism (MINTUR), reports of tourist statistics.

- Annual reports of statistics and rankings elaborated by the *World Tourism Organization* (WTO) and the World Economic Forum (WEF) between 1990 and 2015

Regional and national economic data were accessible in the annual reports and studies by the World Bank (WB), the International Monetary Fund (IMF), the United Nations Development Program (UNDP), the Economic Commission for Latin America and the Caribbean (ECLAC), the Latin American and Caribbean Institute for Economic and Social Planning (ILPES), the Ecuadorian Central Bank *(Banco Central del Ecuador)*, the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ), and other complementary sources like the reports by *Latinobarómetro* and working papers by the International Research Network of Interdependent Inequalities in Latin America (Desigualdades.net) at the Free University of Berlin (FUB).

Raster information (orthophotos, satellite imagery, digitalized maps) and vectorial information (ArcGIS shape files, AutoCAD maps) were obtained by local and global official information sources like Google maps, *Sistema Nacional de Información* or National Information System (SNI), *Instituto Geográfico Militar del Ecuador* or Geographical Military Institute (IGM), and *Instituto Espacial Ecuatoriano* or Ecuadorian Space Institute (IEE). All this raster and vectorial information were compiled and archived in a geographical File Geodatabase, which was created by the software ArcGIS 10.2 from ESRI.

3.4.3. The Habitat II Agenda urban indicators: the first radiography of development

The United Nations Conference on Human Settlements (Habitat II) in Istanbul (1996) was the global meeting where the majority of world nations subscribed an agreement of eradicating progressively poverty around the world by 2015. The *Millennium Development Goals* (MDGs) were defined to establish clear objectives to be achieved. Specific sustainability urban indicators (SUI) were constructed as a tool to monitor the advance of the compliance by different countries in the developed and developing worlds (United Nations, 2015).

The Millennium Development Goals Report 2015 (United Nations, 2015) is a statistical summary of the main advances globally reached by United Nations' members and leaders in the last 15 years. The outcomes are more positive than negative, in words from the UN Secretary-General Ban Ki-moon:

> 2015 is a milestone year. We will complete the Millennium Development Goals. We are forging a bold vision for sustainable development, including a set of sustainable development goals. And we are aiming for a new, universal climate agreement (United Nations, 2015, p. 73).

The process of forging of a bold vision for sustainable development has a clearer path to follow. Moreover, in general terms, the global advances are positively assimilated. Nevertheless, the local realities related to social inequality and to lack of opportunities in the developing world is still not better or even worst. Especially, rural areas in Latin America are the most populated and the poorest. In 2015, the progress on achieving the MDGs was evaluated by UN-Habitat, and new challenges and improvements were included for the 2030 goals (United Nations, 2015; Pozo & Escobar, 2015; Candia, 2011). However, the old indicators of the period 2000-2015 are an important statistical source to measure and compare urban sustainability and development in different scales of reference areas in developing countries around the world.

There were established 8 MDGs, 18 targets, and more than 40 indicators (United Nations, 2004). In terms of urbanisation and development in developing countries, the UN-Habitat department (by the implementation of the Habitat Agenda) is the responsible agent for providing technical assistance to UN members on the achievement of the *Target 11*, which is: "By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers" (United Nations, 2004, p. 3). It is one of the three targets that shape the Goal 7, *Ensure Environmental Sustainability*.

The *Habitat Agenda* is composed of 20 key indicators, nine checklists, and 13 extensive indicators. Additionally, they are divided into clusters (A and B) depending on the statistical information sources used for the construction of the indicators.

- The cluster A corresponds to: “Indicators to be obtained from Censuses and national households’ surveys 2, including Demographic and Health Surveys and Multiple Indicators Cluster Surveys” (United Nations, 2004, p. 7).
- Cluster B are: “Indicators to be obtained from other sources such as official record and published studies of Government institutions, housing boards and agencies, service parastatals, finance institutions, police, NGOs, as well as using informed estimates made by small groups of experts on specific issues” (United Nations, 2004, p. 7).

The *area of reference* is the referential scale of built environment to be measured by the indicators. There are three types of areas of references: urban agglomeration, metropolitan area, and cities. Therefore, the selection of the indicators to be used to measure the advance in the achievement of the Target 11 of the MDGs depends on two factors: the scale or type of reference area, and the existent information for the period 2000-2015. Every national, sub-national, local, and sub-local government has to select the urban indicators that engage with its scale and accessibility to statistical information (Pozo & Escobar, 2015).

In the case of Puerto Lopez, the selected scales are local (*Canton*) and sub-local (small city). The selected indicators are from the cluster A (the sources of statistical information are the Ecuadorian national census 1990, 2001, and 2010). These precisions regarding scale and cluster reduce the number of key indicators from the Habitat Agenda to 9 (Candia, 2011 in Pozo & Escobar, 2015). In the following step, the nine indicators were compared with similar statistical indicators of the Ecuadorian national census 1990, 2001 and 2010 to find compatibilities. The objective was to find the most compatible indicators that can match with the requirements of measuring urban sustainability by the Habitat Agenda.

In total, 19 indicators were identified. The remaining nine indicators correspond to the urban sectors (S) *(sub-local)* in 2010. Nevertheless, this information is useful to characterise the urban sectors and the urban forms in 2010. The MDGs urban indicators used to measure and monitor advances in the local and sub-local scales of the target 11 for the period 2000-2015 are the following (Table 2).

Matching urban indicators from UN-Habitat with existing official statistics in Ecuador (1990-2010)									
UN-HABITAT INDICATORS					ECUADORIAN NATIONAL CENSUS				
Chapter	No	Habitat Agenda	Type	Indicator (UN-Habitat)	No.	Indicators in Ecuadorian National Census	Unity	Scale	Year
1.Shelter	1	Promote the right to adequate housing	A1	Durable structures	1	Percentage of homes living in houses unsuitable conditions	%	C	1990 2001 2010
					2	Percentage of houses with walls made of cement or clay bricks	%	S	2010
					3	Percentage of houses with floors made of concrete subfloor or covered by ceramic tiles	%	S	2010
	2		A2	Overcrowding	4	Percentage of homes living in crowded conditions	%	C	1990 2001 2010
	3	Promote access to basic services	A4	Access to safe water	5	Percentage of houses with potable water supply inside by public network	%	C	1990 2001 2010
					6	Percentage of houses with access to potable water by public network	%	S	2010
	4		A5	Access to improved sanitation	7	Percentage of houses with discharge of wastewater by a public network	%	C	1990 2001 2010
					8	Percentage of houses with access to sewerage public network	%	S	2010
	5		A6	Connection to services	9	Percentage of houses with electricity public service	%	C	1990 2001 2010
					10	Percentage of houses with access to the internet	%	S	2010
					11	Percentage of houses with phone service	%	C	1990 2001 2010
2.Social development and eradication of poverty	6	Provide equal opportunities for a safe and healthy life	A7	Under-five mortality	12	Infant mortality rate (per each 1000 live births)	%	C	1990 2001 2010
	7	Promote social integration and support disadvantaged groups	A9	Poor households	13	Percentage of poor inhabitants per UBN	%	C	1990 2001 2010
					14	Percentage of poor inhabitants per UBN	%	S	2010
	8	Promote gender equality in human settlements development	A10	Literacy rates	15	Illiteracy rate	%	C	1990 2001 2010
					16	Percentage of illiterate inhabitants	%	S	2010
3.Environmental management	9	Promote geographically balanced settlement structures	A11	Urban population growth	17	Population growth annual rate	%	C	1990 2001 2010
					18	Population quantity	#	S	2010
					19	Population density	In/Ha	S	2010

Table 2: UN-Habitat indicators and Ecuadorian census (Source: United Nations, 2004, pp. 8-9)

3.4.4. The voice of local actors (qualitative)

Complementary to undertaking and mapping quantitative data by townscape analysis, the study included the qualitative information obtained by the implementation of semi-structured interviews with the principal players who interact in the built space. It sought to cross-examine and contrast the mapped information about the sustainability of the urban growth with the perception of local actors. The main questions were:

- How do local actors (natives, new residents, visitors) use, read, and understand their town?
- What are their opinions and perceptions about these processes of change?
- Are they aware of them?
- Are these changes affecting (decreasing/improving) their quality of life?

Additionally, the study extracted valuable qualitative information by means of interviews and workshops developed by two other previous studies: (1) the explorative research project *Lineamientos estrategicos para el desarrollo territorial sostenible de la cabecera cantonal Puerto López* (Pozo, et al., 2014) carried out by the IPUR (Institute of Urban and Regional Planning) in 2012; (2) the collective bachelor thesis *Red the equipamientos orientados a la práctica del turismo consciente en la cabecera cantonal Puerto López* (Pozo, Ramírez, Saltos, & Vargas, 2014) performed by graduates of the *Faculty of Architecture and Design* of the *Catholic University of Guayaquil*[6], Ecuador. In total, several semi-structured interviews with local actors, three focus groups, and five workshops with researchers and professionals related to the regional and local planning were developed as part of the research activities of this project.

According to Hay (2010), the semi-structured interview "has some degree of predetermined order but maintains flexibility in the way issues are addressed by the informant" (Hay, 2010, p. 102). "The semi-structured interview is organized around ordered but flexible questioning. In semi-structured forms of interview, the role of the researcher (interviewer of the facilitator) is recognized as being more interventionist than in unstructured interviews. This requires that the researcher redirects the conversation if it has moved too far from the research topics" (Hay, 2010, p. 110). It is being developed in Chapter 7. The main outcome is an indicator-based assessment of the urban sustainability of these specific urban forms and their contribution to the decrease of the resilience of the urban system.

[6] Andrés Pozo, Max Ramírez, Gabriela Saltos, and Verónica Vargas.

3.5. Research design

To address its main objective, the research was focused on four main sub-objectives. These were sequentially tackled and with specific quantitative and qualitative methods related to their corresponding geographical scales (Figure 8).

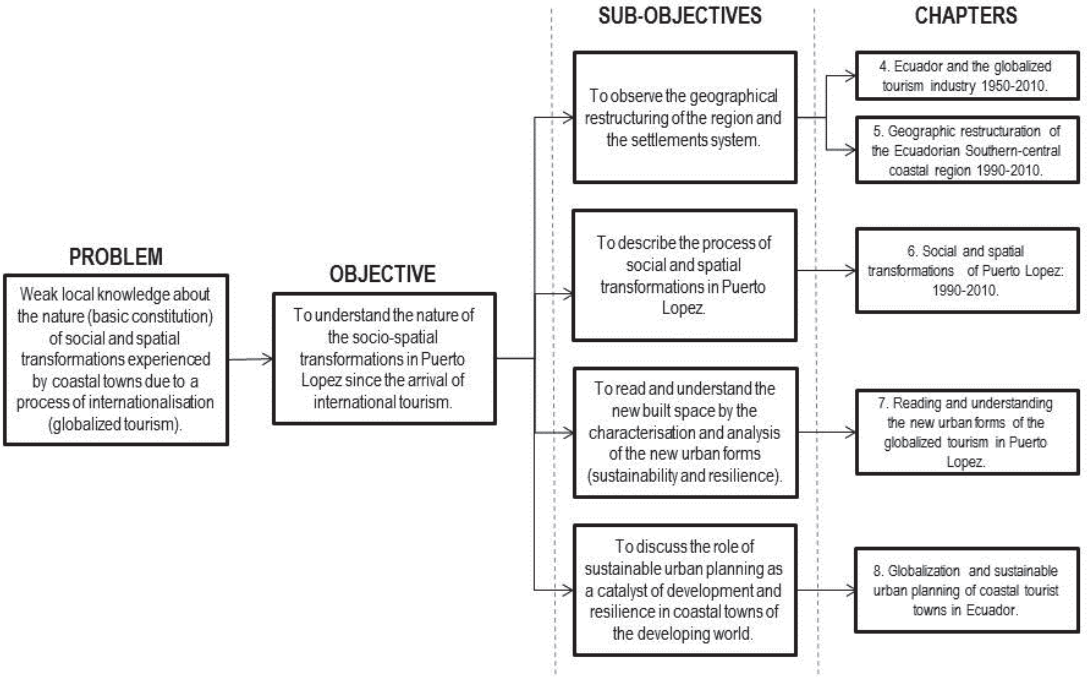


Figure 8: Research structure (Source: Own draft, 2014)

The first sub-objective, "to observe the geographical restructuring of the southern Spondylus region and its settlements system", has a regional geographical scale and was addressed by the description of the principal physical and socio-economic changes of the Spondylus region and its settlements system since the arrival of tourism over the last twenty years (1990 – 2010). It is a descriptive and quantitative research based on the statistical and geographical information.

The second sub-objective, "to describe the process of socio-spatial transformations in Puerto Lopez", has an urban geographical scale and is tackled by the characterisation of the key physical and urban socio-economic changes of Puerto Lopez since the arrival of tourism. It is a descriptive and quantitative research based on statistical and geographical information and was developed in Chapter 6 during the third (WS-2014-2015) and fourth semesters (SS-2015).

The third sub-objective, "to read and understand the new built space" has also an urban scale and is being approached by the characterisation of the principal physical and socio-economic changes captured as physical *traces* by the new urban forms (urban morphology), which emerged during the last two decades and which are close related to tourism. It is a detailed quantitative and qualitative research. The quantitative information is based on statistical and

geographical sources. The qualitative information is obtained by semi-structured interviews (Hay, 2010, p. 109) and observations developed during the field research period (April - May 2015).

The fourth sub-objective, "to discuss the role of sustainable urban planning as a catalyst for development and resilience in coastal towns of the developing world", encompassed the regional and urban geographical scales and was boarded by the analysis and discussion of the actions and reactions of stakeholders during these processes of intense physical and socio-economic transformations. It is an analytical and quantitative research based on the regional and urban planning policies, tools, programs, plans and projects created during the last twenty years.

Finally, the content and discoveries from these four sub-objectives or phases of research (core chapters) fuelled the conclusions and recommendations of the end in Chapter 9. Three big groups shape the structure of the final document: the lead-in Chapters (1, 2 and 3; section A); the core Chapters (4, 5, 6, 7, and 8; sections B + C); and the lead-out Chapter (9; section D) (Table 3).

CHAPTERS			CONTENT	APPROACH
Preface			Cover, Abstract (E/G), Acknowledgments, List of figures, List of tables, Foreword	Preface
LEAD - IN	**Section A: Introductory part**	**1**	Introduction / Problem / Objectives / Research question	Introductory
		2	Theoretical framework	Introductory
		3	Methodology – Methods. Research Design and validation of the scientific process	Introductory
CORE	**Section B: Fundamentals**	**4**	Ecuador and the international tourism industry, 1950-2010	Descriptive Quantitative
		5	Geographical restructuring of the central coastal region	Descriptive / Analysis / Quantitative
	Section C: Research study and results	**6**	Socio-spatial transformations in Puerto Lopez (1990-2010)	Descriptive / Analysis / Quantitative
		7	Reading and understanding the new urban forms of the international tourism in Puerto Lopez	Descriptive / Analysis / Quantitative GIS Qualitative
		8	Socio-spatial transformations and sustainable urban planning	Discussion /Qualitative
LEAD -OUT	**Section D: Conclusion**	**9**	Conclusion and recommendations	Conclusion
Sources and complementary content			Bibliography	
			Annexes	

Table 3: Research design and structure of the dissertation (Source: Own draft, 2014)

Section B: Fundamentals

4. Ecuador and the international tourism industry, 1950 - 2015

International tourism as a global network of transnational flows which transcend borders is the result of what is understood and defined as *contemporary globalisation* or *late globalisation* (Murray & Overton, 2015, p. 90). There is no doubt that the international tourism industry has been growing exponentially during the last six decades. Statistics are clear and transparent. However, its potential as a key for development, particularly in developing or less developed territories, is reasonably questionable.

Tourism is something more than business and a global trade chain; it is a social and cultural phenomenon related to globalisation. Since the end of the 19th century, it has been spreading around the world and societies as part of the economic activities and our ways of life. Developing countries around the world understood it as an opportunity to address poverty and underdevelopment as well as preserve their natural reserves and biodiversity (UN-WTO, 2012; Williams, 2009; Telfer & Sharpley, 2008; Britton, 1991; Britton, 1982).

In Ecuador, it is not a new economic activity, but at the same time, it has not become a traditional exportation commodity or service before the last decade (Prieto, 2011). The Ecuadorian national economy has been based on the exportation of primary products or commodities to the developed world during its colonial and republican periods (Acosta, 2012). Nevertheless, for the last two decades, the promotion and public investment in tourism have increased exponentially.

In the last two decades, tourism has been growing, diversifying and spreading around the Ecuadorian territory. In particular, ecotourism emerged since the 1990s as a new local-global economic activity that locates in natural parks or protected areas in the countryside. However, at the same time, it was promoted, perceived and understood by local governments and poor local communities as a key for development (Pozo, et al., 2014). In this chapter, the evolution and consolidation of international tourism in Ecuador as an important economic activity is described. The aim is to get the first understanding about this globalised industry and how it works in a small economy of the developing world like the Ecuadorian one.

4.1. The Ecuadorian territory

The Republic of Ecuador is a Latin American country located on the tropical north-western coast of South America. In 2010, it comprised 14.5 million of inhabitants on its 256,400 square kilometres of the territorial surface[7], which means a population density of 63 persons per square kilometre (Figure 9).

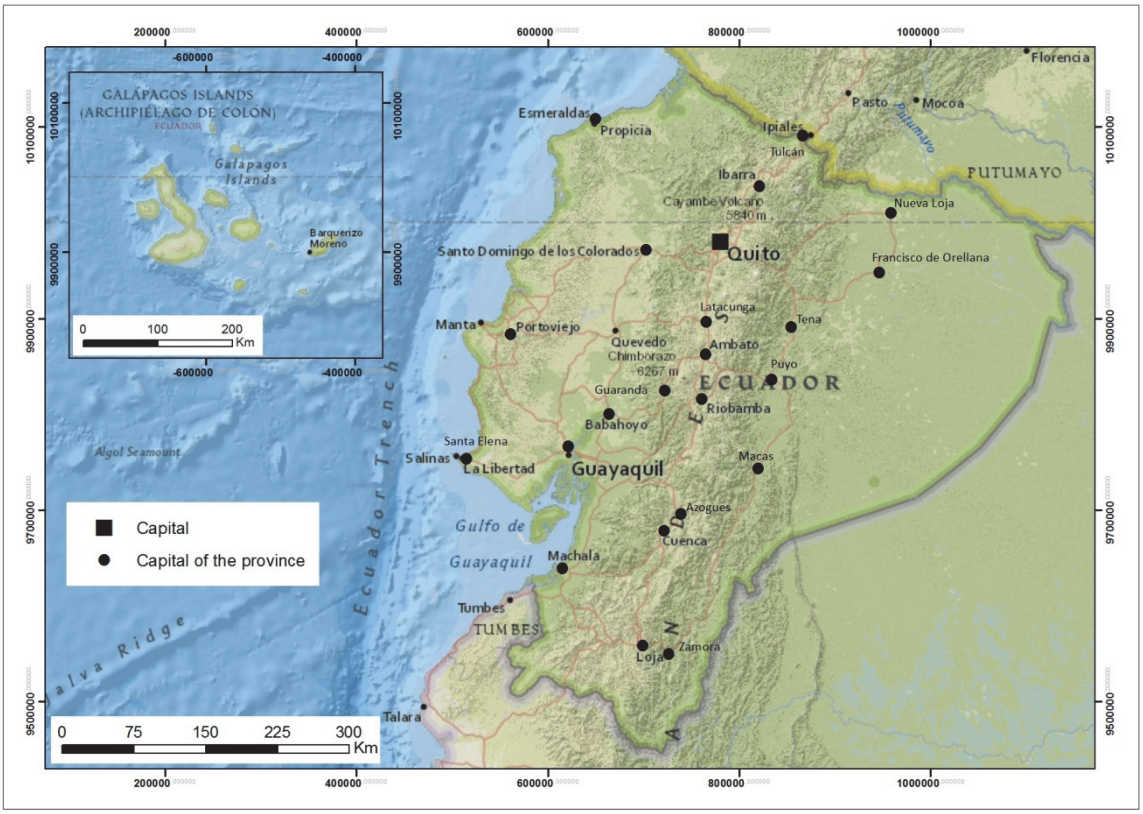


Figure 9: The Republic of Ecuador (Source: ArcGIS Basemap, National Geographical, 2017)

Around 63% of its total population is urban, and its GDP reached a 4.6% rate of growth for the period 2012-2013 and 3.8% for 2013-2014. With a GNI (gross national income) of 90.6 billion US$ and 5,760 US$ per capita in 2013 (Atlas method) (World Bank, 2015, p. 25), Ecuador is an *upper middle income* nation in the global economic geography (World Bank, 2015). The historical and progressive concentration of economic activities, administrative services, and political power since the Colonial period until today has fuelled the population and urban growth of Guayaquil and Quito. The first one has been the principal port city and headquarters of the exportation and importation companies. The latter one has been the capital city and the centre of the political power. Both have historically hosted the most powerful local elites and political parties which have constructed (or destructed) the Ecuador of today. The struggle for power between the Andean and the Coastal oligarchies has been a constant since the independence of the Spanish Colony (Acosta, 2012).

[7] Just to have a physical reference to compare: The Ecuadorian territorial surface (256,400 km²) equals 71.78% of the German territory (357.2 km²) and is almost the same size as the United Kingdom territory (243,600 km²).

4.1.1. Population, internal migration, and urbanisation

In 2010, the dispersed or low-density population was 3.97 million, while the agglomerated or high-density population reached the 10.5 million, i.e. 24.4% and 75.6% of the total population respectively (IGM, 2013, p. 37). In other words, more than the 75% of the Ecuadorian inhabitants lived in large and medium-sized cities with more than 10,000 inhabitants (Figure 10).

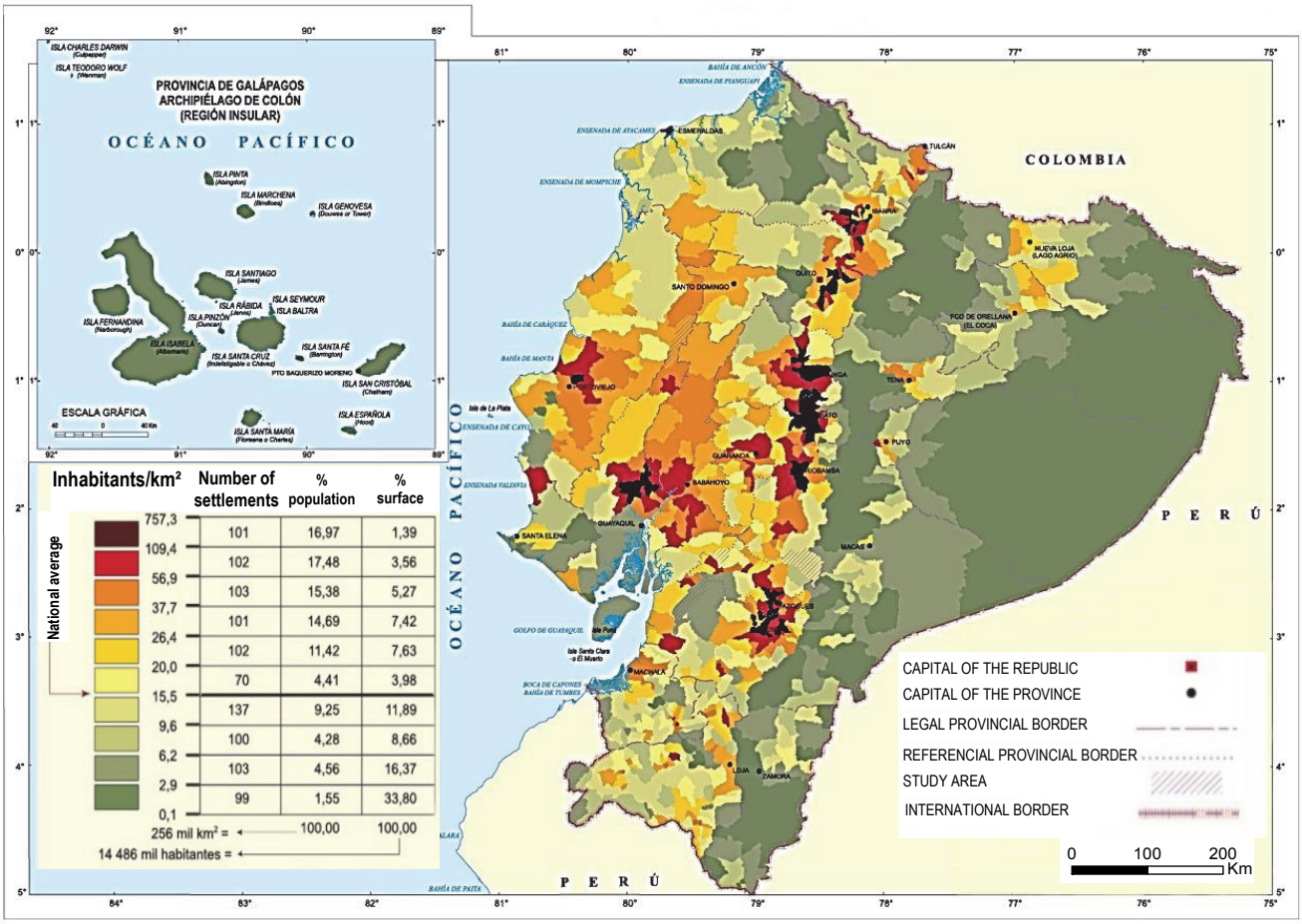


Figure 10: Population density in Ecuador, 2010 (Source: IGM, 2013, p. 36[8])

The settlements network in Ecuador has a bipolar (bi-centralized) and unbalanced structure, regarding the concentration of population and urbanisation. In 2010, there were 109 settlements with more than 10,000 inhabitants and 900 with less. The two largest and most populated urban areas were Guayaquil (2.27 million) and Quito (1.60 million). A second group of midsize urban areas (b) with more than 100,000 and less than 350,000 was formed by 15 cities: Cuenca (329,928), Santo Domingo (270,875), Machala (231,260), Durán (230,839), Manta (217,553), Portoviejo (206,682), Loja (170,280), Ambato (165,185), Esmeraldas (154,035), Quevedo (150,827), Riobamba (146,324), Milagro (133,508), and Ibarra (131,856). Likewise, the rest of midsize cities (c) (between 100,000 and 10,000) were 92. Finally, the number of settlements

[8] The legends and the main texts were translated into English and inserted into the original maps by the author.

with less than 10,000 inhabitants (d) summed up to 900. They were defined as small cities, towns and *recintos* (Table 4 and Figure 11).

Type of city	Population range	Quantity (2010)
Large	>1.5 million <2.5 million	2
Midsize (a)	<1.5 million and >350,001	0
Midsize (b)	<350,000 and > 100,001	15
Midsize (c)	<100,000 and > 10,001	92
Small (d)	< 10,000	900

Table 4: Types and quantity of settlements in Ecuador (2010) (Source: IGM, 2013)

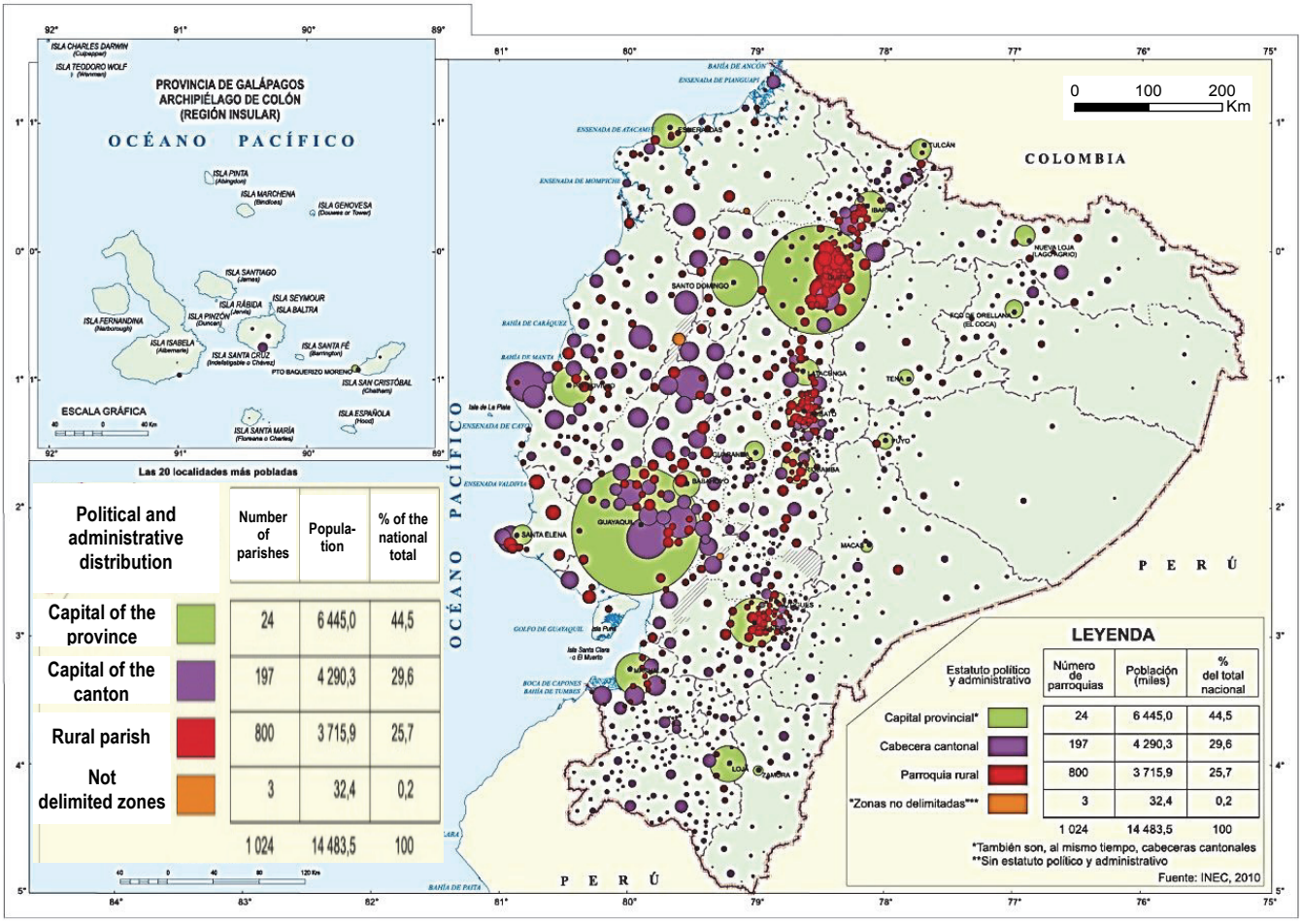


Figure 11: Population (gathered and dispersed) in 2010 (Source: IGM, 2013, p. 41[9])

The Ecuadorian political and administrative division of the country has the following geographical scales: *País* or Nation, *Provincia* or Province, *Cantón* or Canton, and *Junta Parroquial* or Parochial Committee. Every political-administrative division has a state representative that is selected by popular vote. In the case of the Canton, the main administrator of the territory is the municipality or local government. Ecuador has 24 provinces, which are

[9] The legends and the main texts were translated into English and inserted into the original maps by the author.

shaped by cantons or local governments. Every canton is composed of parochial committees. Totally, there are 221 cantons and 1,500 parochial committees (Gobierno del Ecuador, 2011).

In 2010, the 30.3% of the population was between 0 and 14 of age, 63.4% was between 15 and 65 years, and the rest 6.2% had more than 65 years. The majority of the Ecuadorian population (63.4%) is mostly young and adult in the working age (IGM, 2013, p. 42). Regarding migration, there has been a clear decrease of the rural population and a sustaining increase of the urban during the last decade. Particularly, urban *parroquias* like Quito (+397,000), Guayaquil (+250,200), Durán (+138,100), Santo Domingo (+71,700), Calderón (+58,800), Manta (+37,000), Cuenca (+33,100), Sangolquí (+31,900), Machala (+31,300), and Conocoto (+29,600), have had a positive migration balance. On the contrary, the population of settlements in rural areas has consistently been shrinking, specifically in the poorest regions (Figure 12).

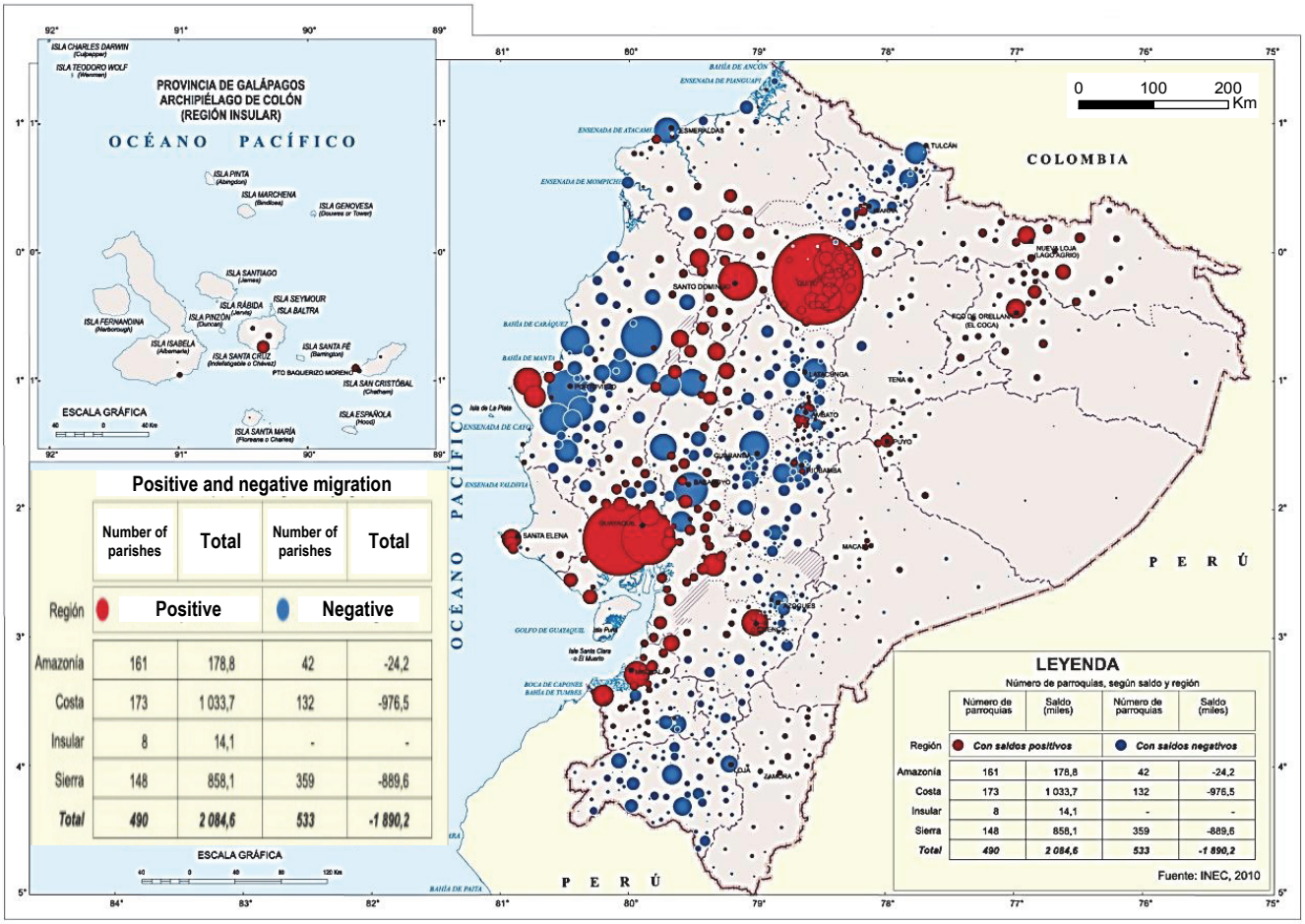


Figure 12: Positive and negative migration balances 2001-2010 (Source: IGM, 2013, p. 50[10])

[10] The legends and the main texts were translated into English and inserted into the original maps by the author.

4.1.2. Geographical regions, ecosystems, landscapes, and biodiversity

Despite being a small country regarding territorial surface, this Andean nation concentrates a huge diversity of geographical zones. They have been supporting the economic structure of its territories for several centuries as an independent republic (1830), a Spanish colony (1492-1830), and even more as the territory of pre-Hispanic empires and tribes (10000 BC – AD 1492). The combination of a rich fishing coastline and agricultural plains in the central coastal region, with the abundance of glacial water sources and fertile volcanic broad valleys in the Andean highlands, and the extraordinary concentration of biodiversity in the wet Amazonas jungle, provides a wide range of landscapes, ecosystems, and microclimates (IGM, 2013) (Figure 13).

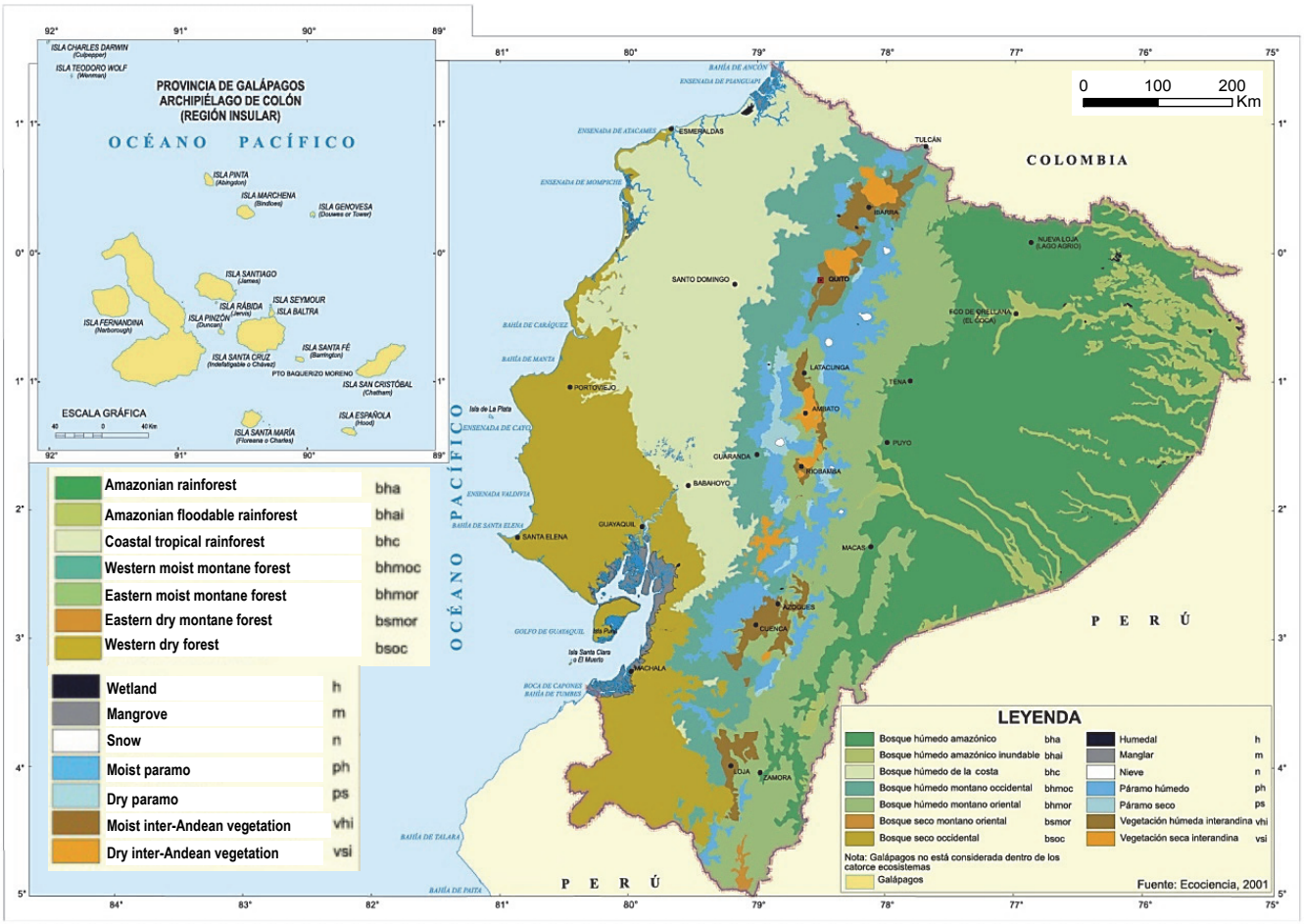


Figure 13: Ecosystems in Ecuador (2001) (Source: IGM, 2013, p. 248[11])

In 2001, 14 main ecosystems were officially identified inside the Ecuadorian territorial borders. A combination of tropical coastal rainforest, dry coastal forest, mangrove, and wetland zones shape the landscapes along the coastline. In the highlands, and depending on the altitude, the Andes mountain chain gives rise to western and eastern pre-montane rainforest and dry forests,

[11]The legends and the main texts were translated into English and inserted into the original maps by the author.

western and eastern montane rainforests and dry forests, sub-tropical valleys, as well as the dry and wet *paramos*. The Amazonas jungle region includes the Amazonian rainforest and the floodable rainforest. Finally, the Galapagos archipelago comprises dry coastal forests and volcanic landscapes. In addition to the public and economic policies, natural landscapes have also been conditioning and moulding the ways of life of people and the social and economic structures, especially in rural areas. Nowadays, the territory is divided into different productive regions, each of them with specific characteristics and levels of social and economic development.

Ecuador is considered a biodiverse country because it concentrates between the 17.90% and 21.65% of species on the planet per ecosystem in more than the 50% of its territory (Andean highlands and Amazonas rainforest). By descending the highlands with direction to the western coastline, the density of biodiversity decreases between 17.90% and 8.45% of species per ecosystem (Figure 14).

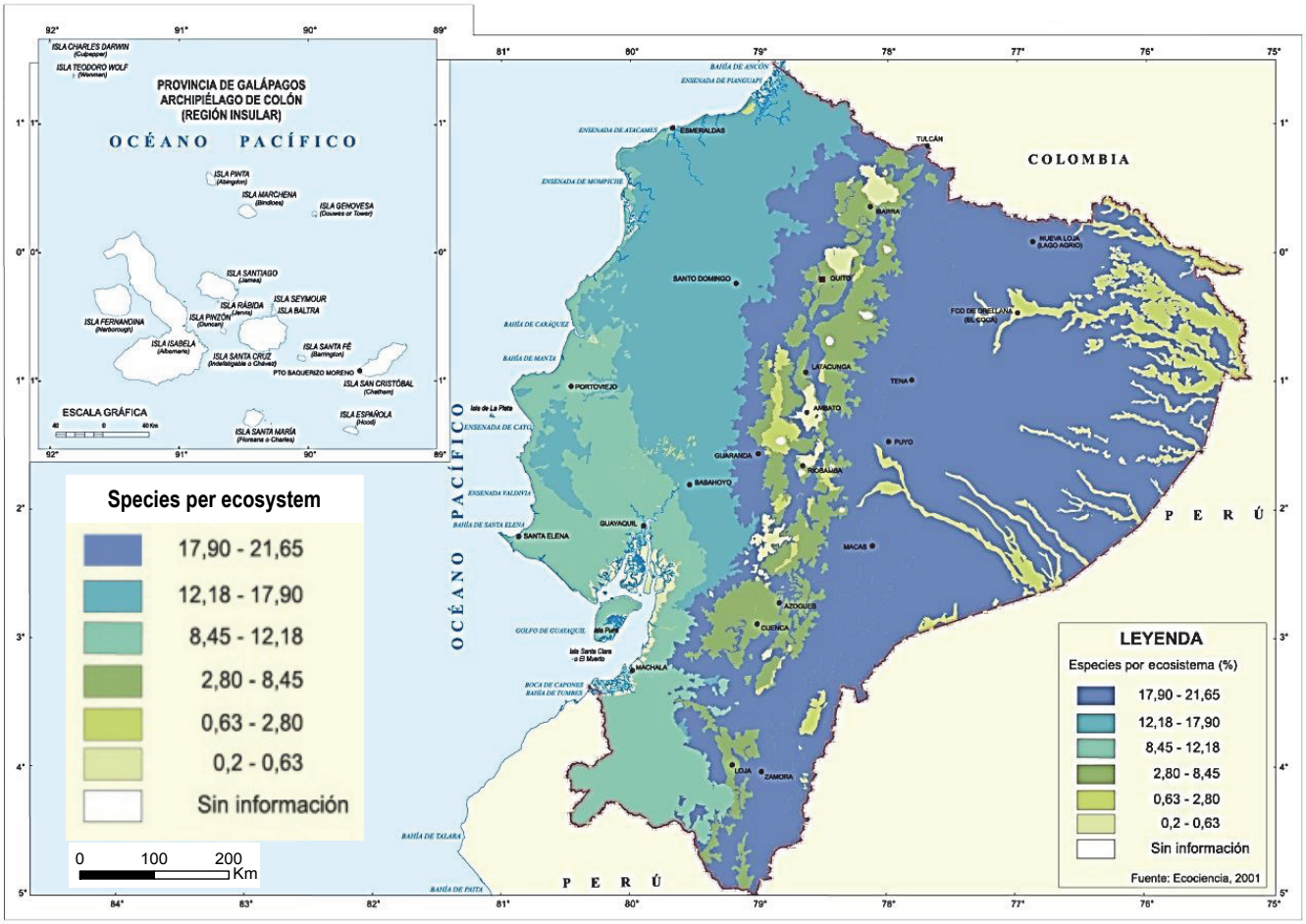


Figure 14: Biodiversity in Ecuador (2001) (Source: IGM, 2013 p. 252[12])

[12] The legends and the main texts were translated into English and inserted into the original maps by the author.

The predominance of the dry forest in the central coastal region, the increase in land use for agriculture (banana, mango, rice, and cacao), aquaculture (shrimps pools) in the lowlands and valleys, and the rise of the process of urbanisation in medium and small size cities, are the main reasons for the biodiversity contrast between the western and eastern regions. In 2001, the coastal region the agricultural and urban land uses predominated over the natural landscapes. Nevertheless, it is important to remark that the most updated cartographic information about land use and biodiversity presented in the *Atlas Geográfico del Ecuador* (IGM, 2013) is based on official sources from 2001 (IRD, 2001; Ecociencia, 2001), which means a considerable weakness for the observation and analysis of the destruction of the natural resource in Ecuador during the last 15 years.

4.2. The international tourism industry

In 2014 international tourism broke a new world record by 1,133 million of tourist arrivals. This quantity means that 4.3% more tourists are visiting foreign countries (overnight visitors) than in 2013, and 40.52% more than in 2000 (674 million), and 260% more tourists than in 1990 (435 million) (UN-WTO, 2015b). Despite the global and local economic crisis, civil wars, and terrorist attacks around the world during the last 25 years, the number of people arriving at other places outside their countries has continuously been increasing. Probably, this is the main reason why the United Nations World Tourism Organization (UN-WTO), as well as the developed and developing countries, agree on promoting it as "the key to achieving development, prosperity, and well-being" (UN-WTO, 2015b, p. 2).

In the developing world, international tourism has been continuously growing. Regarding the period 2006-2014, South America (5.1%) is positioned at the fifth place in the list of regions with the highest average of annual growth of the international tourist arrivals all over the world. In the first places are South Asia (8.6%), South-East Asia (7.9%), Sub-Saharan Africa (6.2%), and North-East Asia (5.3%). Comparing to other regions in the Americas, South America experienced a remarkable growth for the last decade. Traditional beach tourism receptors like Central America (4.8%), North America (3.3%), and the Caribbean (2.0%) were surpassed (Table 5).

	International Tourist Arrivals (million)							Market share (%)	Change (%)			Average annual growth (%)
	1990	1995	2000	2005	2010	2013	2014*	2014*	12/11	13/12	14*/13	'05-'14*
World	**435**	**527**	**674**	**809**	**949**	**1,087**	**1,133**	**100**	**4.2**	**4.6**	**4.3**	**3.8**
Advanced economies¹	**296**	**336**	**420**	**466**	**513**	**586**	**619**	**54.7**	**4.0**	**4.7**	**5.8**	**3.2**
Emerging economies¹	**139**	**191**	**253**	**343**	**435**	**501**	**513**	**45.3**	**4.4**	**4.5**	**2.4**	**4.6**
By UNWTO regions:												
Europe	**261.5**	**304.7**	**386.4**	**453.0**	**488.9**	**566.4**	**581.8**	**51.4**	**3.9**	**4.9**	**2.7**	**2.8**
Northern Europe	28.7	36.4	44.8	59.9	62.8	67.4	71.3	6.3	1.5	2.9	5.9	2.0
Western Europe	108.6	112.2	139.7	141.7	154.4	170.8	174.5	15.4	3.6	2.8	2.2	2.3
Central/Eastern Europe	33.9	58.1	69.3	95.1	98.4	127.3	121.1	10.7	9.1	7.7	-4.9	2.7
Southern/Medit. Europe	90.3	98.0	132.6	156.4	173.3	201.0	214.9	19.0	1.9	5.6	6.9	3.6
- of which EU-28	230.1	268.0	330.5	367.9	384.3	433.8	455.1	40.2	3.0	4.0	4.9	2.4
Asia and the Pacific	**55.8**	**82.1**	**110.3**	**154.0**	**205.4**	**249.8**	**263.3**	**23.2**	**6.9**	**6.8**	**5.4**	**6.1**
North-East Asia	26.4	41.3	58.3	85.9	111.5	127.0	136.3	12.0	6.0	3.4	7.3	5.3
South-East Asia	21.2	28.5	36.3	49.0	70.5	94.3	96.7	8.5	8.7	11.3	2.6	7.9
Oceania	5.2	8.1	9.6	10.9	11.4	12.5	13.2	1.2	4.2	4.6	5.7	2.1
South Asia	3.1	4.2	6.1	8.1	12.0	16.0	17.1	1.5	5.9	11.4	6.8	8.6
Americas	**92.8**	**109.1**	**128.2**	**133.3**	**150.1**	**167.5**	**181.0**	**16.0**	**4.5**	**3.1**	**8.0**	**3.5**
North America	71.8	80.7	91.5	89.9	99.5	110.2	120.4	10.6	4.1	3.6	9.2	3.3
Caribbean	11.4	14.0	17.1	18.8	19.5	21.1	22.4	2.0	3.1	2.8	6.2	2.0
Central America	1.9	2.6	4.3	6.3	7.9	9.1	9.6	0.8	7.3	2.6	5.6	4.8
South America	7.7	11.7	15.3	18.3	23.1	27.1	28.6	2.5	6.3	1.5	5.4	5.1
Africa	**14.7**	**18.7**	**26.2**	**34.8**	**49.5**	**54.4**	**55.7**	**4.9**	**4.8**	**4.7**	**2.4**	**5.4**
North Africa	8.4	7.3	10.2	13.9	18.8	19.6	19.8	1.7	8.7	6.0	0.9	4.0
Subsaharan Africa	6.3	11.5	16.0	20.9	30.8	34.7	35.9	3.2	2.8	4.1	3.3	6.2
Middle East	**9.6**	**12.7**	**22.4**	**33.7**	**54.7**	**48.4**	**51.0**	**4.5**	**-5.3**	**-3.1**	**5.4**	**4.7**

Table 5: International tourist arrivals per continent and regions (Source: UN-WTO, 2015b, p. 4)

The giant global industry of international tourism has a huge, complex, and also volatile network deployed around the world. According to UN-WTO, in 2014 international tourism contributed 9% to of the global GDP and produced 1.5 trillion dollars in exports. The latter meant the 6% of all the global exports during a year. Additionally, it is estimated that everyone

out of eleven jobs in the world is directly or indirectly related to tourism. It is a global market that has been growing from 25 million of international tourists in 1950 to 1,133 million in 2014. It is expected to continue to rise to almost 1.8 billion in 2030 (UN-WTO, 2015b, p. 3) (Figure 15).

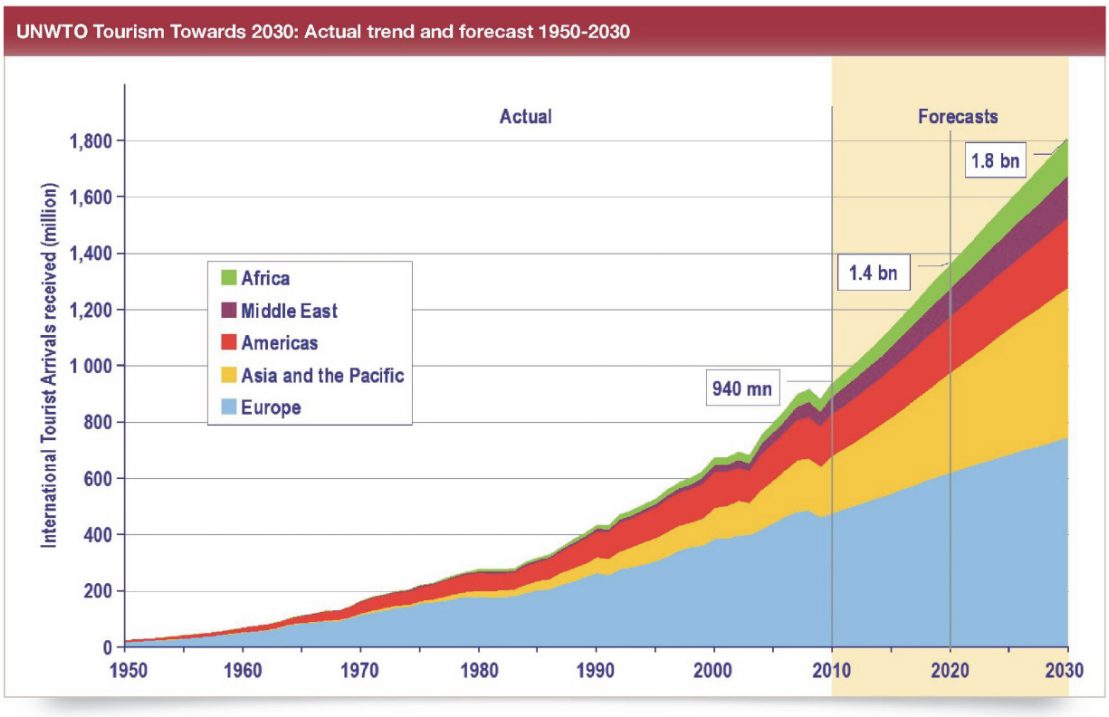


Figure 15: Actual tourist trend and forecast 1950-2030 (Source: UN-WTO, 2015b, p. 14)

This prognosis is founded on the study *Tourism towards 2030* elaborated by the United Nations World Tourism Organization (UN-WTO, 2011). It is a long-term quantitative projection of the international tourism demand for the following two decades (2010-2030). This study replaced the past projections defined by the former *Tourism 2020 Visions*, which was the first referent for tourism statistics and planning at the beginning of the 21st century (UN-WTO, 2001).

The future of international tourism as a globalised market seems to be promising for all regions. However, the competition to catch these flows of capital and tourists is more complex that it appears to be, particularly for developing countries. With natural disasters and pressures over territories increasing due to global climate change effects, the opportunities for a fair competition between economic regions, countries, and local-global actors in the territory would be less accessible (United Nations, 2015; Williams, 2009; Telfer & Sharpley, 2008). Likewise, other local problems, limitations, and weaknesses in developing countries contribute to complicating their chances to win and increase their probabilities to lose. Lacks of security, political instability, populism, economic crises, civil wars, pandemics, migration, and others, are some of the typical problems that constrain development in the third world's countries (Telfer & Sharpley, 2008). Although their positive advances in poverty reduction and basic service supply (officially monitored by the Millennium Development Goals 2000-2015), Latin American

countries are facing a new century with severe deficiencies in their capacity of resilience against new threats like climate change and peak oil effects. The majority of these nations are still dependent on commodity exportation. Their primary economic sectors are vulnerable and difficult to be replaced for new economic activities based on second or tertiary sectors (Acosta, 2012).

Nowadays, the tourism industry is facing critical challenges. For the developed world as well as for the developing, international tourism is called to be an opportunity for economic and social development for all. Particularly, it seems to be a great opportunity for poor communities in developing countries to increase their capacities of resilience against new challenges related to underdevelopment, like the rise of natural disasters, pandemics, insecurity, unemployment, and local economic crisis (World Economic Forum, 2009). This discourse has been repeated and patented in all Latin American countries in different tones and with various perspectives for the last six decades. Regarding the diversity of political and economic contexts of every nation during each decade, international tourism has had a positive acceptance in cities and remotes places integrated into the global market. Based on official statistics, there is no doubt that international tourism intensified and expanded its operations dramatically during the last two decades as a globalised market around the world. Nevertheless, the impacts in local economies, societies, cultures, and natural environment are diverse (Telfer & Sharpley, 2008).

4.2.1. Definitions and concepts related to tourism

The consolidation of tourism as one of the largest global industries during the last decades implied also its expansion and diversification as a diffuse industry regarding definition and activities. The main problem seems to be that "the practices and organisation of tourism exceed its categories" (Gregory, 2009, p. 762). However, various definitions of tourism have been created and categorised for different purposes. According to Telfer & Sharpley (2008), there are two types of definitions: technical and conceptual.

On the one hand, the technical definitions "attempt to identify different categories of tourism for statistical or legislative purposes. Various parameters have been established to define a tourist, such as minimum (one day) and maximum (one year) length of stay, minimum distance travelled from home (160 km) and purpose, such as 'holiday' or 'business' (WTO/UNSTAT, 1994)" (Telfer & Sharpley, 2008, p. 5).

> Tourism is the temporary short-term movement of people to destinations outside the places where they normally live and work, and their activities during their stay at these places; it includes movement for all purposes, as well as day visits or excursions (UK Tourism Society) (Telfer & Sharpley, 2008, p. 5).

> Tourism is the activities of persons travelling to and staying in places outside of their usual environment for not more than one consecutive year for leisure, business, and other purposes (UN-WTO, 1994) in (Gregory, 2009, p. 762).

On the other hand, the conceptual definitions "attempt to convey the meaning or function as a particular social institution. Typically, they emphasise the nature of tourism as a leisure activity that contrasts with normal, everyday life (perhaps the most commonly held perception of what tourism is) and provides a basis for assessing behaviour and attitudes" (Telfer & Sharpley, 2008, p. 5). The UN-WTO (2015) states the following definition:

> Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents), and tourism has to do with their activities, some of which imply tourism expenditure (UN-WTO, 2015).

Regarding *Sustainable Tourism*, the UN-WTO states in the publication *Tourism in the Green Economy* (2012) the following definition:

> Tourism in the green economy refers to tourism activities that can be maintained, or sustained, indefinitely in their social, economic, cultural, and environmental contexts:

> ‘sustainable tourism’. Sustainable Tourism is tourism that takes full account of current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities. It is not a special form of tourism; rather, all forms of tourism may strive to be more sustainable (UNEP, UNWTO, 2005, in UN-WTO, 2012, p. 1).

According to the UN-WTO, sustainable tourism should:

> (1) Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural resources and biodiversity; (2) respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance; and (3) ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation (UN-WTO, 2012, p. 1).

Likewise, it calls for a distinction between the terms *ecotourism* and *sustainable tourism*:

> The term ecotourism itself refers to a segment within the tourism sector with focus on environmental sustainability, while the sustainability principles should apply to all types of tourism activities, operations, establishments and projects, including conventional and alternative forms. The term sustainable tourism describes policies, practices and programmes that take into account not only the expectations of tourists about responsible natural resource management (demand), but also the needs of communities that support or are affected by tourist projects and the environment (supply). Sustainable tourism thus aspires to be more energy efficient and more climate sound (for example by using renewable energy); consume less water; minimize waste; conserve biodiversity, cultural heritage and traditional values; support intercultural understanding and tolerance; generate local income and integrate local communities with a view to improving livelihoods and reducing poverty. Making tourism business more sustainable benefits local communities, and raises awareness and support for the sustainable use of natural resources (UN-WTO, 2012, p. 2).

4.2.2. Global and local actors involved in the tourism industry

There are thousands of public and private organisations working in the fields of tourism and development around the world. Nevertheless, there is one supranational organisation that has been its main promoter for 45 years. The United Nations World Tourism Organization (UN-WTO) has been globally leading the promotion and researching of tourism as a key for development. This United Nations agency was created in 1970 and has the main mission of promoting tourism as "a driver of economic growth, inclusive development, and environmental sustainability" (UN-WTO, 2015a, p. 3). Nowadays, UN-WTO is the main official source of definitions, studies, and statistics related to tourism and development.

Other international (NGOs, public and private) organizations globally supporting international tourism are the Organisation for Economic Co-operation and Development (OCDE) -Tourism Committee; the World Economic Forum (WEF); the Asia–Pacific Economic Cooperation - Tourism Working Group; the World Travel and Tourism Council (WTTC); National Tourism Organizations (NTO); International Civil Aviation Organization (ICAO); International Air Transport Association (IATA).

Similarly, there are also NGOs and private organizations promoting sustainable tourism and ecotourism like the Global Sustainable Tourism Council (GSTC); the International Ecotourism Society (TIES); Global Travel Association Coalition (GTAC); the Rainforest Alliance; Sustainable Travel International (STI); the International Ecotourism Society (IETS); Centre for Responsible Travel (CREST); Tourism Cares; International Centre for Responsible Tourism (ICRT); Tourism Concern; *Observatorio de Turismo Irresponsable*; *Red Internacional de Investigadores en Turismo, Cooperación y Desarrollo* (COODTUR); and many others deployed in regional, national, and local scales in all the continents.

On the regional and national scales of the developing world (in this case Latin America), the ministries of tourism play a central role in the planning, coordination, promotion, control, monitoring, and implementation of public policies in the practice of domestic and international tourism over the territories. This central role depends on of each governmental structure and political context, but in general terms, the tourism ministries are the head of plenty of groups of private institutions and public organisations working directly or indirectly in tourism. In Ecuador, the local governments or municipalities are also responsible for the promotion and practice of tourism, but they always work in close coordination with the tourism ministry or MINTUR (MINTUR, 2007).

In a second, but not less significant level, there are also hundreds of private associations of providers of tourism services like accommodation (hotels, hostels, and resorts), transport

(airlines, cruise ships, trains, buses, taxis, car rental), tour operators, food services (restaurants, buffets), and many others. These organisations are the local-global connection with the international tourism industry network, which is shaped by transnational corporations with a huge capacity of investment (Telfer & Sharpley, 2008). This space is the arena where the local elites of developing countries work together with the transnational corporations and international investors. The local elite companies, by representing transnational corporations, usually are settled in the largest cities, from where they manage their social and economic and political power to decide where and how to invest their capital (Telfer & Sharpley, 2008).

On the local and sub-local levels, there are hundreds of private and public associations, which group a huge diversity of actors directly or indirectly related to tourism. In developing countries, these labour associations or civic organisations are legally founded to provide protection and support the work in the local or sub local informal economic structure (Telfer & Sharpley, 2008). Just to take one example, in Ecuador the *taxi moto* (motorbike taxis) drivers have a civic or labour association in each tourist town along the south-central coast. The majority of these partnerships have a legal basis, code number, and name. By this way, the local *taximoteros* or motorbike drivers can work in groups and have the protection of a legal association in case of several typical problems like accidents, theft, diseases, economic crisis, natural disasters, and others. Also, if they need a bank loan or a legal reference to buying a new motorbike or a house, the membership in an association gives them a real legal status as a reference. In other words, this is an "informal" way to ensure their own economic growth and development (Pozo, et al., 2014; Pozo, Ramírez, Saltos, & Vargas, 2014).

At the bottom of this socio-economic structure of the tourism industry in developing countries, there are the native families who fight their every day to survive and to catch something of the profits. Several informal networks of economic activities are deployed and push all the time to engage in the formal structures. In some cases, there is a relatively good integration, in others, there is isolation between the formal and the informal networks (Telfer & Sharpley, 2008; Madeley, 2001; Britton, 1982).

4.3. The evolution of the tourism industry in Ecuador

In 1950, international tourism was officially, and for the first time in the Ecuadorian constitutional history, considered by the government as an instrument for development. This change was part of the modernising policies promoted by the President Galo Plaza Lasso (1948-1952). A governmental office for international tourism opened, and new tourist destinations emerged. This event marked the beginning of the history of the international tourism in Ecuador.

According to Prieto (2011), the evolution of international tourism in Ecuador consists of two main periods: 1950-1990 and 1990-2008. The first is characterised by the support of the state with infrastructure and promotion of international tourism but at the same time a modest development of the local tourism industry. The second is a period influenced by the spreading of the global consciousness in the 1990s about the urgency of sustainable development and climate change, when several new concepts, definitions, and proposals emerged as sustainable tourism, green tourism, conscious travel, and ecotourism (UN-WTO, 2012; Prieto, 2011).

The emerging of a third period (2007-2015) is proposed in the present study. It comprises the new political and economic context developed by President Rafael Correa's socialist government (2007-2017). The elaboration of a new constitution and the transformation of the political structure marked a *before and after* in the history of Ecuador. New public policies reflect this process of transformation, programs, and projects promoted and fostered by renovated ministries and public institutions.

In the 1950s, the first initiatives of international tourism development were focussed primarily on the promotion of the Ecuadorian highlands and the indigenous culture. The main target was the North American market. The *misión cultural indígena* or indigenous cultural mission promoted the international tourism in Otavalo, an old indigenous town in the Andean mountains near Quito. Also, a basic hotel infrastructure began to develop in Quito, and the first private tourist operators arose. Shortly after that, other private enterprises were deployed in the city of Guayaquil and on the Galapagos Islands (Prieto, 2011).

Even if these first efforts to promote Otavalo and the Galapagos Islands as tourist products for the American market contributed to their consolidation as international tourist destinations, the development of the tourism industry in Ecuador has remained modest during this first period (1950-1990). On the contrary, other Latin American countries like Mexico and Peru achieved access to the global tourism market as tourist destinations thanks to the successful promotion of their archaeological and natural heritage (Prieto, 2011).

With the creation of the United Nations World Tourism Organization (UN-WTO) in 1970, a new approach to tourism as key for development was promoted, especially by the developing countries. In 1990, the number of foreign visitors per year in Ecuador reached 350,000. In 2009, this quantity was nearly tripled to 900,000 (Prieto, 2011, p. 10). Nevertheless, this statistical information also includes the arrival of frontier countries visitors (Colombia and Peru) for business, commerce, or other reasons not related to tourism or leisure. This fact means a significant limitation for statistical studies due to the not clear difference between tourist arrivals and economic migration (Prieto, 2011).

During the last five years, international visitors have been increasing year by year in the Americas. In the specific case of Latin America, there are the traditional tourist countries in the Caribbean and Central America that keep growing. In 2014, the largest tourist recipient countries in the Americas were United States (74 million), Mexico (29 million), and Canada (16 million). Mexico is the Latin American giant with 29 million of international tourist arrivals in 2014, which equals the sum of all the arrivals from the South American countries together in the same year (UN-WTO, 2015a).

A second range is composed of countries like Brazil, Argentina, and the Dominican Republic, with an average of 6 million international tourist arrivals per year. The third group of tourist countries has a range between 2 and 3 million. It comprises Costa Rica, Colombia, Peru, Uruguay, Chile, Puerto Rico, Jamaica, and Cuba. Finally, there is the group of small tourist economies with less than 2 million international visitors in 2014: Ecuador, Panama, Nicaragua, Guatemala, Aruba, and Bahamas. The rest of the countries which have less than 1 million arrivals are Venezuela, Bolivia, El Salvador, Honduras, and others (UN-WTO, 2015b).

Despite still being part of the group of small tourist economies in Latin America, Ecuador has increased the number of international visitors by some 50% over the last five years. It is one of the highest Latin American growth rates. Nevertheless, this increase is not a coincidence. It is the outcome of an aggressive strategy of international promotion in the most important tourism markets. Additionally, the Ecuadorian government has focussed a high percentage of public investment in the improvement of the transport infrastructure (highways, bus terminals, harbours, and airports) and the construction of new public policies and laws to facilitate the promotion and implementation of tourism as a key for local economic and social development (Acosta, 2012).

Particularly, the current national government under Rafael Correa (2007-2013, 2013-2017) has the long-term goal of transforming the Ecuadorian productive matrix (based on oil production and the exportation of primary products like bananas, shrimps, cacao, and flowers) into a tertiary economy grounded on the exportation of biotechnology and ecotourism services. This

goal has been written in the Constitution (2008) and in the *Plan Nacional del Buen Vivir* (Wellbeing National Plan). Subsequently, it trickled down to all the complementary tools of planning in the different scales of territories (national, subnational, local, sub-local) (Pozo, et al., 2014; SENPLADES, 2013; SENPLADES, 2009; Gobierno del Ecuador, 2008).

Destinations	Series[1]	International Tourist Arrivals (1000)				Change (%)			Share (%)	International Tourism Receipts (US$ million)				Share (%)
		2010	2012	2013	2014*	12/11	13/12	14*/13	2014*	2010	2012	2013	2014*	2014*
Americas		**150,105**	**162,528**	**167,520**	**180,965**	**4.5**	**3.1**	**8.0**	**100**	**215,022**	**249,358**	**264,165**	**273,996**	**100**
North America		99,520	106,404	110,205	120,376	4.1	3.6	9.2	66.5	164,831	191,777	204,506	210,943	77.0
Canada	TF	16,219	16,344	16,059	16,528	2.0	-1.7	2.9	9.1	15,829	17,407	17,656	17,445	6.4
Mexico	TF	23,290	23,403	24,151	29,091	0.0	3.2	20.5	16.1	11,992	12,739	13,949	16,258	5.9
United States	TF	60,010	66,657	69,995	74,757	6.1	5.0	6.8	41.3	137,010	161,631	172,901	177,240	64.7
Caribbean		19,547	20,571	21,145	22,446	3.1	2.8	6.2	12.4	22,589	24,299	25,382	27,090	9.9
Anguilla	TF	62	65	69	71	-1.6	6.8	2.7	0.0	99	113	121	123	0.0
Antigua & Barbuda	TF	230	247	244	249	2.3	-1.2	2.2	0.1	298	319	322	330	0.1
Aruba	TF	825	904	979	1,072	4.0	8.3	9.5	0.6	1,251	1,402	1,501	1,599	0.6
Bahamas	TF	1,370	1,422	1,364	1,422	5.6	-4.0	4.2	0.8	2,163	2,311	2,285	2,308	0.8
Barbados	TF	532	536	509	520	-5.5	-5.2	2.2	0.3	1,034	918	964	947	0.3
Bermuda	TF	232	232	236	224	-1.7	1.8	-5.1	0.1	442	441	440	413	0.2
Brit. Virgin Islands	TF	330	351	366	386	4.0	4.2	5.4	0.2	389	397	421	..	..
Cayman Islands	TF	288	322	345	383	4.1	7.4	10.8	0.2	485	489	500	..	..
Cuba	TF	2,507	2,815	2,829	2,970	4.7	0.5	5.0	1.6	2,187	2,326	2,344	..	..
Curaçao	TF	342	420	441	452	7.6	5.0	2.5	0.2	385	543	583	..	..
Dominica	TF	84	86	86	87	4.6	0.2	0.9	0.0	94	79	72	75	0.0
Dominican Rep.	TF	4,125	4,563	4,690	5,141	5.9	2.8	9.6	2.8	4,163	4,687	5,064	5,637	2.1
Grenada	TF	110	116	116	134	-1.7	0.2	14.7	0.1	112	122	119	128	0.0
Guadeloupe	TCE	392	325	487	..	2.5	49.8	..	..	510	..	671	..	..
Haiti	TF	255	349	420	465	0.1	20.2	10.8	0.3	169	447	568	..	..
Jamaica	TF	1,922	1,986	2,008	2,080	1.8	1.1	3.6	1.1	2,001	2,046	2,074	2,255	0.8
Martinique	TF	476	487	490	490	-1.6	0.5	0.0	0.3	472	462	484	483	0.2
Montserrat	TF	6	7	7	9	35.5	-1.5	22.2	0.0	6	7	6	6	0.0
Puerto Rico	TF	3,186	3,069	3,200	3,246	0.7	4.3	1.4	1.8	3,211	3,193	3,334	3,438	1.3
Saint Lucia	TF	306	307	319	338	-1.8	3.9	6.1	0.2	309	335	347	360	0.1
St. Kitts & Nevis	TF	98	104	107	114	2.5	2.6	7.0	0.1	90	95	100	104	0.0
St. Maarten	TF	443	457	467	499	7.6	2.2	6.9	0.3	674	842	857	..	..
St. Vincent & Gren.	TF	72	74	72	71	0.7	-3.5	-1.4	0.0	86	94	97	101	0.0
Trinidad & Tobago	TF	388	455	434	413	5.5	-4.5	-5.0	0.2	450	..	..	..	..
Turks & Caicos	TF	281	292	291	435	-17.6	-0.4	49.9	0.2	..	..	..	..	..
US Virgin Islands	TF	590	580	570	..	9.1	-1.8	..	..	1,013	1,153	1,232	..	..
Central America		7,908	8,860	9,087	9,592	7.3	2.6	5.6	5.3	6,699	8,700	9,376	10,174	3.7
Belize	TF	242	277	294	321	10.7	6.1	9.2	0.2	249	298	351	380	0.1
Costa Rica	TF	2,100	2,343	2,428	2,527	6.9	3.6	4.1	1.4	1,999	2,313	2,665	2,864	1.0
El Salvador	TF	1,150	1,255	1,283	1,345	5.9	2.2	4.9	0.7	390	558	621	822	0.3
Guatemala	TF	1,219	1,305	1,331	1,455	6.5	2.0	9.3	0.8	1,378	1,419	1,481	1,564	0.6
Honduras	TF	863	895	863	868	2.7	-3.5	0.6	0.5	625	679	608	630	0.2
Nicaragua	TF	1,011	1,180	1,229	1,330	11.3	4.2	8.2	0.7	313	421	417	445	0.2
Panama	TF	1,324	1,606	1,658	1,745	9.1	3.2	5.2	1.0	1,745	3,013	3,233	3,470	1.3
South America		23,131	26,693	27,083	28,551	6.3	1.5	5.4	15.8	20,904	24,581	24,901	25,789	9.4
Argentina	TF	5,325	5,587	5,246	5,935	-2.1	-6.1	13.1	3.3	4,942	4,887	4,313	4,627	1.7
Bolivia	TF	679	798	798	..	12.2	0.0	..	..	379	594	573	..	..
Brazil	TF	5,161	5,677	5,813	..	4.5	2.4	..	..	5,702	6,645	6,704	6,843	2.5
Chile	TF	2,801	3,554	3,576	3,673	13.3	0.6	2.7	2.0	1,645	2,150	2,181	2,252	0.8
Colombia	TF	2,385	2,177	2,288	2,565	6.6	5.1	12.1	1.4	2,797	3,460	3,611	3,914	1.4
Ecuador	VF	1,047	1,272	1,364	1,557	11.5	7.2	14.1	0.9	781	1,033	1,246	1,482	0.5
French Guiana	TF	..	..	..	..	..	..	..	..	..	..	..	..	..
Guyana	TF	152	177	200	206	12.6	13.2	2.9	0.1	80	64	77	..	..
Paraguay	TF	465	579	610	649	10.6	5.3	6.4	0.4	217	265	273	282	0.1
Peru	TF	2,299	2,846	3,164	3,215	9.5	11.2	1.6	1.8	2,008	2,443	3,009	3,001	1.1
Suriname	TF	204	240	249	246	8.9	3.8	-1.1	0.1	61	71	84	95	0.0
Uruguay	TF	2,349	2,695	2,684	2,682	-5.7	-0.4	-0.1	1.5	1,509	2,076	1,921	1,760	0.6
Venezuela	TF	526	988	986	..	66.1	-0.2	..	..	740	844	858	..	..

Table 6: Tourist arrivals in the Americas 2010-2014 (Source: UN-WTO, 2015b, p. 10)

According to the statistics developed by the Ecuadorian Tourism Ministry (MINTUR) in the *Plan Integral de Marketing Turístico 2014* (Master Plan for Tourism Marketing 2014) (MINTUR, 2009), the tourism industry experienced a modest growth for the period 2002-2007 regarding some international tourist arrivals. The Compound Annual Growth Rate (CAGR) index from Ecuador between 2002 and 2007 was 6.5% (MINTUR, 2009, p. 32). Nevertheless, this growth did not mean an increase in its capacity of global competitiveness.

In 2007, the World Economic Forum (WEF) for the first time published the *Travel & Tourism Competitiveness Report 2007* (TTCR). It is a global report based on local and regional statistics related to tourism in different countries of the developed and developing the world. The core of this report is the ranking of the *Tourism and Travel Competitiveness Index* (TTCI), which "aims to measure the factors and policies that make it attractive to develop the T&T sector in different countries. The TTCI is composed of 13 main pillars or indicators of T&T competitiveness (World Economic Forum, 2007, p. xiii):

1. Policy rules and regulations
2. Environmental regulation
3. Safety and security
4. Health and hygiene
5. Prioritisation of Travel & Tourism
6. Air transport infrastructure
7. Ground transport infrastructure
8. Tourist infrastructure
9. ICT infrastructure
10. Price competitiveness in the T&T industry
11. Human resources
12. National tourism perception
13. Natural and cultural resources

Since 2007, six TTCR (2007, 2008, 2009, 2011, 2013, and 2015) have been published by the WEF. The report is a primary source of information for governments, stakeholders and foreign investors of the tourism industry. In the TTCR-2007, Ecuador was placed 97th in a list of 124 countries in the ranking of the Travel & Tourism Competitiveness Index (TTCI). However, during the following years later, this position did not experience significant changes. In 2008, Ecuador ranked 86th of a list of 130 countries, while it ranked 81st of 140 countries in 2013 (World Economic Forum, 2013, p. 10). Regrettably, in the last report (2015), Ecuador does not appear in the official ranking[13] (World Economic Forum, 2015) (Table 7).

In comparison to other regional competitors, the situation of Ecuador in the global and regional tourism market is not as profitable and competitive as the current national government has promoted it. Regionally, in 2014 the largest tourism markets regarding *international tourist arrivals* and *international tourist receipts* were Mexico, Brazil, Argentina and the Dominican Republic. In a second group are Panama, Costa Rica, Peru, Colombia, Uruguay, Chile, Puerto

[13] There is not an official explanation in the report of the TTCR ranking 2015 (World Economic Forum, 2015) about the reasons why Ecuador, Cuba, Haiti, Aruba, and Bahamas did not appear in the list.

Rico, Jamaica, and Cuba. Finally, there is a third group composed of Ecuador, Guatemala, Nicaragua, Aruba, Bahamas, Venezuela, Paraguay, Honduras, El Salvador, and Bolivia (Table 7).

	Sources	World Bank, 2014	UN-WTO, 2014	UN-WTO, 2014	TTCR, 2015	TTCR, 2015	TTCR, TTCI (Ranking 2015)				
No	Country	GDP 2014 (billion/trillion US$) *2013, **2011	International tourist arrivals 2014 million	International Tourism Receipts 2014 million US$	T&T industry GDP 2014 (% of total)	T&T industry employment 2014 (% of total)	2007	2009	2011	2013	2015
1	Brazil	2,346 trillion	5.81*	6,843	3.5%	3.0%	59	45	52	51	**28**
2	Mexico	1,282 trillion	29.01	16,258	5.9%	6.4%	49	51	43	44	**30**
3	Panama	46.21 billion	1.75	3,470	5.9%	5.9%	55	55	56	37	**34**
4	Costa Rica	49.55 billion	2.52	2,864	4.6%	4.6%	41	42	44	47	**42**
5	Chile	258.1 billion	3.67	2,252	3.2%	3.2%	45	57	57	56	**51**
6	Puerto Rico	103.1 billion*	3.25	3,438	2.3%	1.8%	-	53	45	52	**55**
7	Argentina	540.2 billion	5.93	4,627	3.5%	3.4%	64	65	60	61	**57**
8	Peru	202.9 billion	3.21	3,001	3.5%	2.4%	81	74	69	73	**58**
9	Colombia	377.7 billion	2.56	3,914	1.7%	2.2%	72	72	77	84	**68**
10	Uruguay	57.47 billion	2.68	1,760	2.8%	2.7%	56	63	58	59	**73**
11	Jamaica	14.36 billion*	2.08	2,255	7.7%	7.0%	48	60	65	67	**76**
12	Guatemala	58.73 billion	1.46	1,564	3.3%	2.9%	69	70	86	97	**80**
13	Dominican R	63.97 billion	5.14	5,637	4.7%	4.2%	50	67	72	86	**81**
14	Ecuador	100.5 billion	1.56	1,482	1.9%*	1.7%*	97	96	87	**81**	**-**
15	Honduras	19.39 billion	0.87	630	5.8%	5.0%	88	83	88	93	**90**
16	El Salvador	25.22 billion	1.35	822	3.5%	3.1%	77	94	96	104	**91**
17	Nicaragua	11.81 billion	1.33	445	4.0%	3.3%	89	103	100	95	**92**
18	Bolivia	34.18 billion	0.80	573*	2.5%	2.1%	109	114	117	110	**100**
19	Venezuela	510 billion	0.99*	858*	3.2%	2.8%	99	104	106	113	**110**
20	Paraguay	30.98 billion	0.65	282	1.4%	1.2%	111	122	123	115	**113**
21	Haiti	8.71 billion	0.46	568*	1.4%	1.1%	-	-	-	140	**133**
22	Cuba	77.15 billion*	2.97	2,344*	-	-	-	-	-	-	**-**
23	Aruba	2.58 billion**	1.07	1,599	-	-	-	-	-	-	**-**
24	Bahamas	8.51 billion	1.42	2,308	-	-	-	-	-	-	**-**

Table 7: Tourism in Latin America (Sources: WB, 2015; UN-WTO, 2014; WEF, 2015)

It is interesting to note some differences in the impact of international tourism on the economy of countries with similar macroeconomic characteristics. In 2014, Panama had almost the same amount of international tourist arrivals as Ecuador, but the Central American country received the double of international tourism receipts (3,470 million US$) than the Andean nation (1,482 million US$). While the tourism industry in Panama represented 5.9% of its GDP and 5.9% of the employment, in Ecuador tourism just produced the 1.9% of its GDP and 1.7% of the total employment. These differences are important to consider, especially by regarding the fact that the 2014 GDP of Panama (46.21 billion US$) is almost the half of the Ecuadorian one (100.5 billion US$).

Likewise, more gaps in terms of competitiveness emerge by comparing the Ecuadorian tourism industry with the tourism industry of other countries that share similar geographical location, climate (tropical South and Central Pacific coast), and tourist attractions or products (beach resorts, biodiversity, pristine landscapes) like Costa Rica, Peru, Colombia, and others (Table 8).

No	Countries South and Central Pacific Coast	GDP 2014 (billion/ trillion US$) *2013, **2011	International tourist arrivals 2014 million	International Tourism Receipts 2014 million US$	TTCR, TTCI (Ranking 141) 2015	T&T industry employment 2014 (% of total)	T&T industry GDP 2014 (% of total)
1	Mexico	1,282 trillion	29.01	16,258	30	6.4%	5.9%
2	Panama	46.21 billion	1.75	3,470	34	5.9%	5.9%
3	Honduras	19.39 billion	0.87	630	90	5.0%	5.8%
4	Costa Rica	49.55 billion	2.52	2,864	42	4.6%	4.6%
5	Nicaragua	11.81 billion	1.33	445	92	3.3%	4.0%
6	El Salvador	25.22 billion	1.35	822	91	3.1%	3.5%
7	Peru	202.9 billion	3.21	3,001	58	2.4%	3.5%
8	Guatemala	58.73 billion	1.46	1,564	80	2.9%	3.3%
9	Chile	258.1 billion	3.67	2,252	51	3.2%	3.2%
10	Ecuador	100.5 billion	1.56	1,482	81*	1.7%*	1.9%*
11	Colombia	377.7 billion	2.56	3,914	68	2.2%	1.7%

Table 8: Tourism along the Pacific coastline (Sources: WB, 2015; UN-WTO, 2014; WEF, 2015)

In 2014, Ecuador had the highest increase in international tourist arrivals in South America (+14%) by overtaking Argentina (+13%), Colombia (12%), Paraguay (+6%), Chile (+3%), and Peru (+2%) (UN-WTO, 2015b, p. 7). The previous year (2013), the national government had invested almost 60 million US$ directly in tourism. According to the tourism ministry, Ecuador will invest another 600 million US$ in the following four years (2013-2017). The main objective of the national government is that tourism reaches the second or first place in the list of no-oil Ecuadorian exportation incomes in the next decade. A first huge step was achieved in 2013 when tourism positioned at the fourth venue of the national incomes of no-oil national exportations with 1,251 million US$. The first was bananas (2,793 million US$), shrimps (2,000 million US$), and processed seafood products (1,624 million US$) (MINTUR, 2014b, p. 14).

In addition to the economic resources focussed on the international promotion of the country as a tourist destination, the current national government (2007-2017) invested in the reconstruction and the improvement of the transport infrastructure (roads, bus stations, airports, and harbours), and in the provision of basic services (potable piped water, sewerage, and electricity) in tourist regions and all over the country. Thanks to the high prices of petroleum experienced by Ecuador for the period 2007-2012, the massive improvement of basic and transport infrastructure became possible. Between 2006 and 2012, the quantity of public investment was multiplied per six. It grew from 1,943 million US$ (2006) to 11,118 million US$ (2012). Likewise, the national income due to the exportation of petroleum increased from 2,144 million US$ (2000) to 11,691 million US$ (2014). The contribution of the oil exportations to the Ecuadorian national budget has been traditionally representative, but irregular: 35.40% (1980); 45.02% (1990); 40.14% (2000); 21.65% (2006); 13.17% (2007); 32.28% (2008); 19.84% (2009); and 27.85% (2010) (Acosta, 2012, p. 507).

According to Acosta (2012), Ecuador is facing the end of an economic cycle characterised by the oil-dependency, and the exportation of agricultural-marine commodities i.e. bananas, shrimps, coffee, cocoa, flowers, and others. Nowadays, the country is entering into a new phase of modernization and redesigning of its old economic and political structures to compete in the global markets. This new phase is referred to the *post-mining Ecuador* and has influenced the national and regional planning of the current national government since 2007. Nevertheless, these long-term process of transition of the Ecuadorian economy has been not as easy as it was originally expected at the beginning (Acosta, 2012) (Table 9).

Year	Oil exportation income (% of the GNP)	GDP (millions US$)	Remittances % GDP	Petroleum % GDP	Bananas %GDP	FDI Foreign Direct Investment (%GDP)	Poverty (%)
1970	0%	1,629	-	-	-	5.44%	-
1980	35.40%	11,733	-	-	-	0.60%	-
1990	45.02%	10,569	-	-	-	1.19%	-
1995	37.99%	20,288	2.12%	7.75%	4.76%	2.61%	-
2000	40.14%	16,283	8.17%	13.17%	5.04%	5.28%	65%
2005	25.21%	20,965	11.55%	25.74%	5.17%	2.35%	42%
2006	21.65%	21,962	13.33%	31.57%	5.52%	1.24%	38%
2007	13.17%	22,409	13.78%	33.15%	5.81%	0.87%	37%
2008	32.28%	24,032	11.74%	43.97%	6.83%	4.18%	35%
2009	19.84%	24,119	10.34%	26.05%	8.27%	0.61%	36%
2010	27.85%	24,983	9.30%	35.83%	8.14%	0.63%	33%

Table 9: Ecuadorian GNP, GDP, and poverty, 1970-2010 (Source: Acosta, 2012 p. 507)

One of the strongest critics of the current national government emerged due to an apparent contradiction between its economic and political discourses. Ecuador needs to engage itself in the global tourism market if it wants to expand and foster its international tourism industry as one of the principal sectors in its productive matrix. Local scepticism arises due to the decrease of foreign investment in Ecuador for the last decade partly caused by the socialist economic politics of the current national government. Acosta (2012) identifies as the main reason the instability of the Ecuadorian economy and its deficient management by the current populist national government, which has contributed to dispel the arrival of foreign direct investment. The outcome is a "limited economic growth without structural changes, despite experiencing a period of high incomes due to the exportation of oil" (Acosta, 2012, p. 330). However, for the national government, the main reason resides in the structural transformation lead by President Correa, which meant the implementation of a socially equal local economy and a sovereign international insertion in the global market (SENPLADES, 2013). This revolutionary political process has not been a "friendly environment" for the traditional neoliberal economic groups and elites who had been the local connectors with the FDI.

4.3.1. Planning tourism development in Ecuador

As mentioned above, the year 2007 meant the beginning of changes in several aspects. The socialist government under Rafael Correa launched a process of deep transformations in the administrative and political structures of the state. The first outcome was the creation of an entirely new national Constitution (2008) to facilitate the structural changes promoted by the president and his political party. The *Citizen Revolution* or *Revolución Ciudadana* marked a new breakpoint in the political history of Ecuador. It fostered the development of new laws, regulations, and planning tools focussed on the achievement of the wellbeing vision defined in the Constitution (2008) and the *Wellbeing National Plan* (*Plan Nacional del Buen Vivir*) (Figure 16).

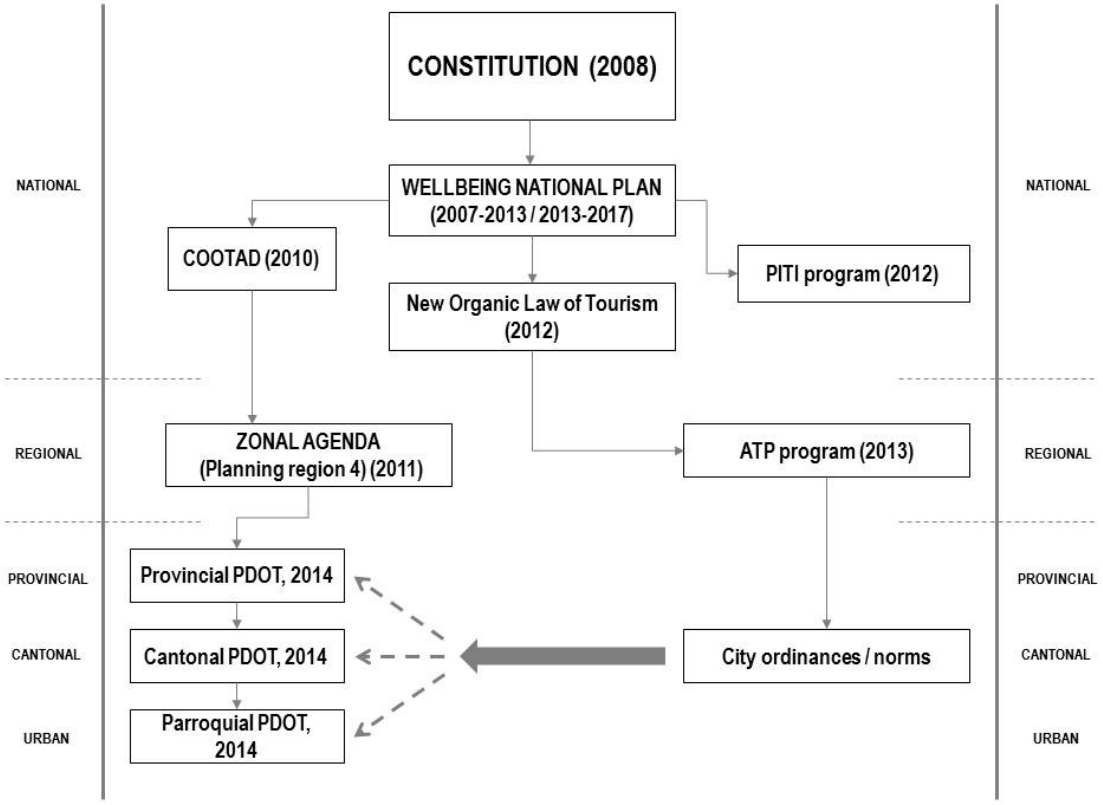


Figure 16: Current planning tools and laws related to tourism (Source: Own draft)

One of the first deep changes, mentioned by the national government as an innovation regarding governing worldwide, was the inclusion of the *rights of nature* into the new Ecuadorian constitution (2008). In Chapter 7, articles 71 to 74, it details them as the following:

> Nature or *Pacha Mama*, where live reproduces and realises, has the right to be integrally respected regarding its existence, maintaining, and regeneration of its life cycles, structure, functions, and evolutionary processes. All persons, community, town or nationality can demand of the public authorities the compliance of the nature rights.

> For applying and interpreting these rights, the established principles in the constitution will be appropriate (Gobierno del Ecuador, 2008, Chapter 7, Art.71, p. 20).

This new approach and interpretation of nature, as an ancient strategic national resource to protect and preserve, was included in the content of the subsequent planning tools and laws. The *Wellbeing National Plan 2013-2017* translated the content of the constitution in objectives, goals, and strategies to be achieved by the national, regional, and local governments during the presidential period. The main long-term objective is the transformation of the national productive matrix for the year 2030. It was established based on a process of 4 phases and a huge program of public investment in infrastructure for the next 15 years (SENPLADES, 2013; SENPLADES, 2009). The national budget for the period 2013-2017 was structured and divided into strategic sector based on the transformation of the productive matrix (Table 10).

Multi-Year Investment Plan by Sectorial Cabinet (2013-2017)

In millions of USD

Sectorial Cabinet	2013	2014	2015	2016	2017	2013-2017
Social Development	1 998	1 563	1 406	1 158	859	6 984
Economic Policy	20	5	3	6	9	43
Production, employment and competitiveness	2 284	2 086	2 668	2 952	2 990	12 980
Strategic Sectors	2 778	3 120	2 177	2 045	2 083	12 203
Security	745	1264	856	735	929	4 529
Knowledge and human talent	1 095	1 064	1 659	2 153	2 275	8 246
Other functions of the State	178	475	163	93	58	967
Other insitutions of Excecutive Branch	407	281	237	304	431	1 660
Overall Total	9 505	9 858	9 169	9 446	9 634	47 612

Table 10: Multi-year investment plan 2013-2017 (Source: SENPLADES, 2013, p. 114)

In 2007, the Ecuadorian Tourism Ministry published the "Strategic Plan for Sustainable Tourism Development 2006-2020" or *Plan Estratégico de Desarrollo de Turismo Sostenible 2006-2020* (PLANDETUR 2020). Since then, it has been the most updated study about the situation of domestic and international tourism in Ecuador and also has been the basis for follow-up plans, programs, and projects related to tourism.

The most important observation presented by the PLANDETUR 2020 was:

> There is a remarkable lack of statistic and marketing studies, specifically regarding the fact that the few available statistical studies do not content deep analysis or analysis related to other variables. This allows us to conclude that the previous research about tourism in Ecuador characterised by a profuse elaboration of consultancies and documents, lack of guidance and concatenation between studies, and the absence of quantitative analysis that enables the private and governmental decision-making based on tendencies and facts (MINTUR, 2007, p. 11).

Despite these fundamental limitations, planning documents elaborated for the development of sustainable tourism in Ecuador since 1999 have been used as sources of official information for the construction of the master plan PLANDETUR 2020. Particularly, during the period between 1999 and 2006 various studies, plans, and reports were produced (Table 11).

Type	Documents	Year	Period	Status	Implemented
National plans	Tourism competitiveness plan	1999	1999-2004	Approved	Paralysed
	Governmental action plans to improve competitiveness in Ecuador BID EC-CSS-214	2003	2003	Approved	In execution
Marketing	Integral plan of tourism marketing	2003	2003-2006	Approved	In execution
	Tourism Benchmarking 2000-2001	2000		Approved	N.I.
	Report. Evolution workshop FMPT 2006	2006		Approved	In execution
	Design of tourist products of Ecuador	2003		Approved	N.I.
Sectorial plans and strategies	National Strategy of Ecotourism 2003	2003		Approved	Updating
	Strategy against the sexual exploitation tourism - OMT	2005		Approved	In execution
	Strategy for bird observation tourism 2006	2006	2006-2016	Approved	In execution
	TYPSA Study of the feasibility of natural and communitarian tourism in the southern zone of Ecuador	2006		Final draft	N.I.
	Communitarian tourism strategy	2004		Approved	In execution
	Rural tourism strategy	2003		Approved	In execution
Decentralisation and regional plans	Report. Current situation of decentralisation 2005	2005		Approved	N.I.
	Logical framework of the decentralisation unit, MINTUR	2006	2010	Approved	In execution

Table 11: Tourism master plans 1990-2016 compiled by T&L (Source: MINTUR, 2007, p. 13)

4.3.2. Current internal demand and supply of tourism services in Ecuador

Despite several economic crises, natural disasters, and political problems, the Ecuadorian tourism industry has been growing since 1990. In 2011, the Tourism Ministry (MINTUR) published a study about the demand and supply of services, and infrastructure of the domestic and international tourism in Ecuador (MINTUR, 2011). It is the most updated report regarding statistics and inventory of tourism services. Concerning the demand of tourism services, the first remark is that the domestic and international tourists have different behaviours according to their payment capacity and preferences.

The first difference is related to the locations that each one tends to visit. In 2011, international tourists preferred to visit the largest cities like Quito (65.30%), Guayaquil (47.50%), and Cuenca (19%). Likewise, they visited the Galapagos Islands (15%), and Baños de Ambato (11%)[14]. On the other hand, domestic tourists tend to visit Guayaquil (8.1%) and Quito (6.1%) too, but also beach resorts cities like General Villamil Playas (3.5%), Salinas (3.4%), and Atacames (3.4%) (MINTUR, 2011, pp. 13-14).

The second difference is related to the amount of expenditure and the length of stay. While the average expenditure per day by international tourists is 1,000 US$ and the average duration of stay is 14 nights, domestic tourists expend around 94 US$ and lodges three nights (MINTUR, 2011, p. 15). As far as the supply of tourism services is concerned, the number of officially registered tourist establishments in Ecuador modestly increased from 14,467 (2007) to 18,355 (2011). Similarly, the supply of lodging services grew significantly. In 2011, the Tourism Ministry reported 3,935 accommodation establishments (hotels, hostels, and others), 78,907 rooms and 178,374 beds. The latter experienced an increase of 21.32% since 2007 (MINTUR, 2011, p. 21). Additionally, the number of jobs directly related to tourism grew by 34.75% from 75,198 (2007) to 101,329 (2011) (MINTUR, 2011, p. 21). This data does not consider the number of jobs of the informal labour market in urban and rural areas, which is huge and not easy to quantify.

[14] Baños de Ambato is a tourist town located in the Andean Mountains, near the Tungurahua volcano.

4.3.3. Quantity and quality of the tourist offer

According to PLANDETUR 2020, in 2007 the inventory of tourist products was comprised "1,635 tourist attractions, of which 712 were natural sites and 923 cultural manifestations" (MINTUR, 2007, p. 45). The transportation and communication infrastructure has played a major role in the concentration and dispersion of international and domestic tourism over the country. The two international airports located in Quito and Guayaquil has been the main entrances of international tourists to the country, while the improved road network has connected several cities and towns to the flows of domestic tourists that each deploys on holidays and vacations. Particularly, the Pan-American or Andean highway, which crosses the country from north to south, is the hugest concentrator of tourist destinations (Figure 17).

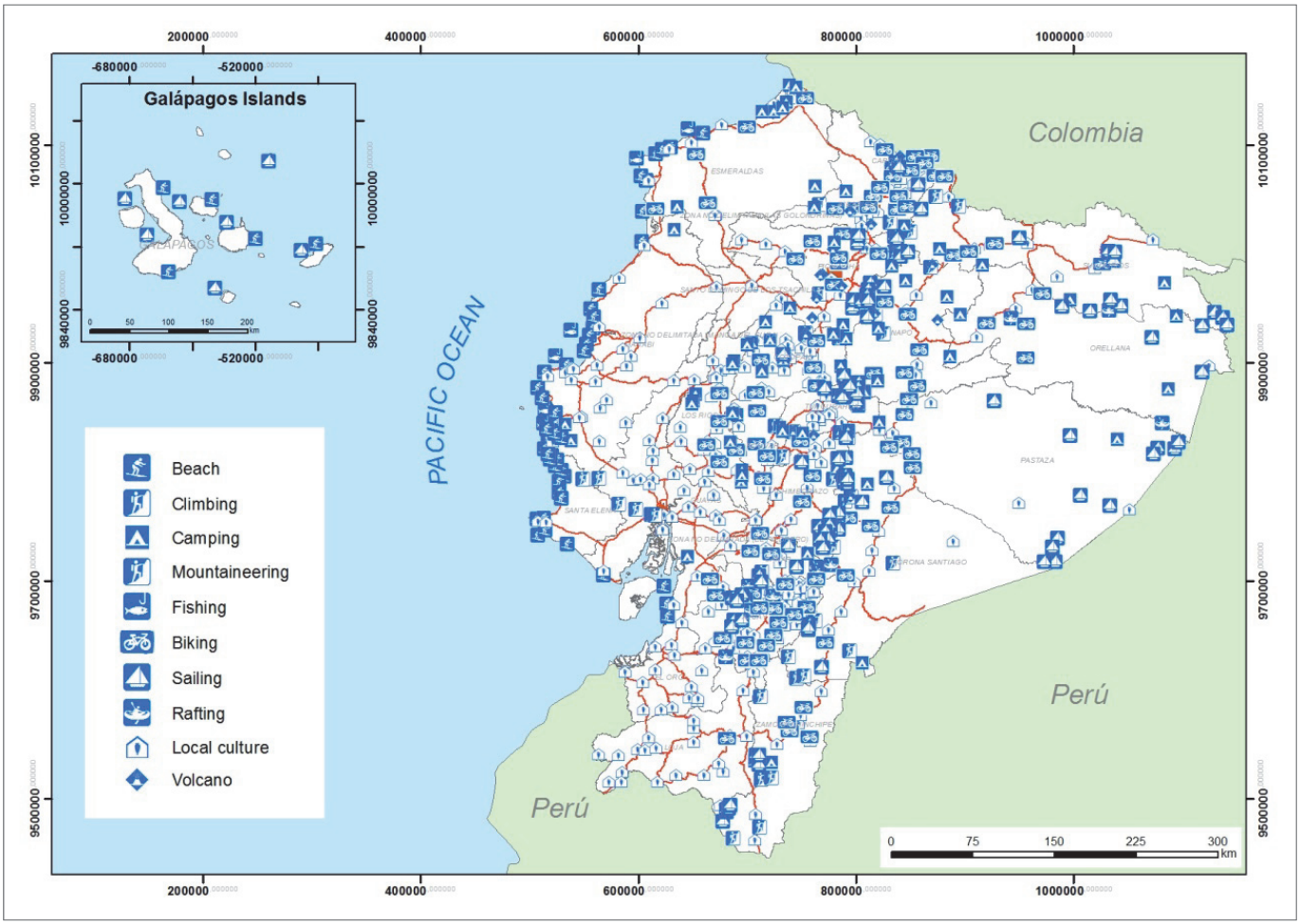


Figure 17: Tourist attractions in Ecuador (Source: IGM, 2013, p. 206)

Even though the diversity of natural landscapes and tourist attractions dispersed all over the four geographical regions of Ecuador, in 2008 the majority of the tourist infrastructure and services were still gathered in the north of the Andean highlands around the capital city of Quito. In lesser amounts, the cities of Cuenca, Guayaquil, Manta, Loja, and Machala are also spots that accumulate tourism services. In the following map, the mayor concentration of tourism services

in Ecuador is demarcated in by an intense red colour. The highest concentration is located around the capital city of Quito, in the northern Andean region (Figure 18).

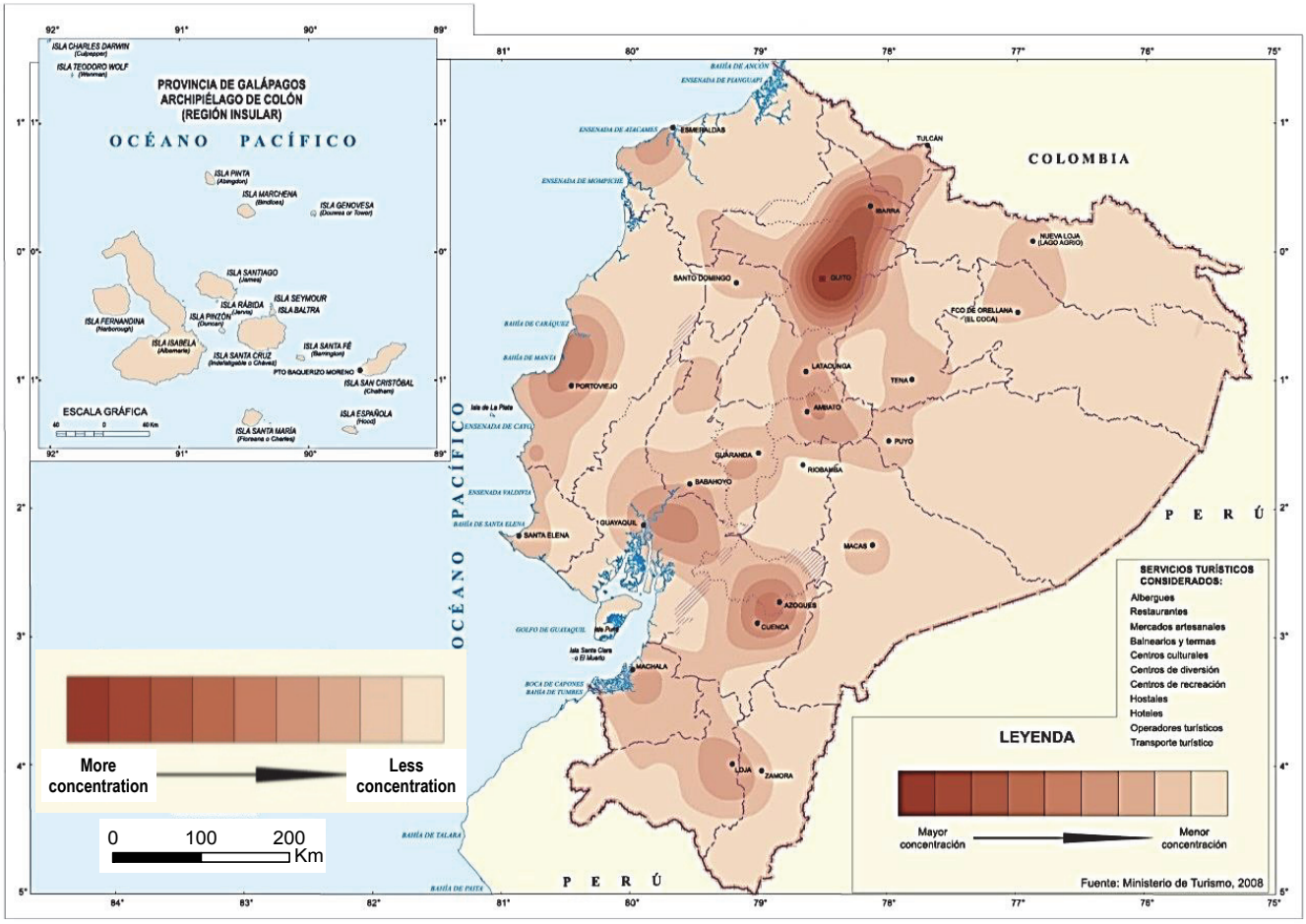


Figure 18: Concentration of tourism services (Source: IGM, 2013, p. 205[15])

The MINTUR defines the quality of the tourist attractions in Ecuador by a hierarchy of four levels. The fourth and highest level corresponds to the natural sites or cultural manifestations which have a high value in the international tourism market. In the third level are the tourist attractions with a current flow of domestic tourism, and in low percentage foreign visitors. The second and the first are the tourist attractions with some remarkable features and with a complementary role of other tourist destinations respectively (Table 12).

[15] The legends and the main texts were translated into English and inserted into the original maps by the author.

Hierarchy	Definition	Natural sites	Cultural manifestations
4	Exceptional tourist attractions with high value for the international tourism, and with the self-capacity of motivating significant current or potential flows of tourists.	31.12%	9.45%
3	A tourist attraction with exceptional characteristics, with the capacity to motivate (independently or with other attractions) a current or potential flow of domestic tourists, and in low percentage international visitors.	27.30%	40.20%
2	A tourist attraction with some remarkable feature, with the capacity to catch the attention of long-distance travellers from the domestic or international market, who visit the zone due to other tourist attractions, or that come from frontier countries (Peru or Colombia).	41.50%	50.42%
1	Tourist attractions without merit to be included in the previous hierarchies, but at the same time, which is part of the list of the tourist heritage that can complement other attractions.		

Table 12: Percentage of tourist attractions per hierarchies (2006) (Source: MINTUR, 2007, p. 46)

In 2007, just the 31.12% (221) of the natural sites, and 9.45% (87) of the cultural manifestations belonged to the group *hierarchy 4*. It is the highest value and describes it as an "exceptional tourist attractions with great value for the international tourism and with the self-capacity of motivating significant current or potential flows of tourists" (MINTUR, 2007, p. 45). The rest of tourist attractions pertained to the other three hierarchies.

Concerning the conservation status of the tourist attractions, there are also particular characteristics to remark. In 2006, the 50% of the tourist attractions were conserved, 10% were not altered, 20% were altered, 12% were in the process of deterioration, and 5% were totally deteriorated. To sum up, 63% were conserved or not altered, while the rest 37% needed to be physically improved (MINTUR, 2007, p. 46). Likewise, the accessibility to essential services is an important feature to consider for the development of the quality, sustainability and efficiency of the tourist offer provided by the tourist attractions. From the 712 identified original sites as tourist attractions, just the 26% had potable piped water, 38% had electricity, and 19% had accessibility to a public sewage system (MINTUR, 2007, pp. 47-48).

Despite the copious quantity of tourist attractions in 2006, particularly of natural sites due to the huge diversity of eco-systems and landscapes, the quality of the services offered to tourists has been poor regarding natural conservation and accessibility to essential services. However, without basic services, it is almost impossible to develop the private or public infrastructure of the basic international tourist standards. Particularly, for the international tourism market these requirements are strategic and, together with other variables like security, communication, transport, local economy, and others, define the arrival of flows of tourists and direct foreign investment to territories in the developing world (Murray & Overton, 2015; Telfer & Sharpley, 2008; Vorlaufer, 1996). This fact has perfectly been understood by the current national government, and since 2007 has been kept as the main argument for an aggressive program of public investment in the construction and reconstruction of basic infrastructure in several tourist

settlements. Additionally, the reconstruction, and expansion of the terrestrial transport network of highways and roads, added to the improvement of the main international and domestic airports, bus terminals, and harbours, have been part of the public initiative to increase the access of domestic and international tourists to diverse tourist attractions and to insert the country into the tourism global market (SENPLADES, 2013a; SENPLADES, 2013b; MTOP, 2011).

In 2014, a significant improvement of the access to the tourist attractions had been achieved. However, the lack or deficiency of basic infrastructure, and the extreme levels of poverty and vulnerability in rural settlements, are still impairing against the opportunities to develop a local tourism industry with acceptable standards and with the capacity to attract international tourism flows and foreign direct investments (Pozo, et al., 2014, p. 66; MINTUR, 2007, p. 20).

Regarding the development of ecotourism, as one of the most increasing and profitable branches of the international tourism market over the last decade, Ecuador's national parks and natural reserves are the most valuable resource to offer locally and globally. The Ecuadorian National System of Protected Areas (SNAP) concentrates 4.7 million of hectares of protected areas in 34 national parks; i.e.,.18.5% of the national territory (MINTUR, 2007, p. 50). In 2005, the SNAP received 430,000 visitors. The most visited protected areas were the national parks Galapagos, Cotopaxi, Cotacachi-Cayapas, Machalilla, Cuyabeno, Cajas, and Chimborazo. According to local studies about biological diversity, Ecuador is promoted as a mega-biodiverse territory that concentrates 18% of birds, 18% of orchids, 10% of amphibians, and 8% of mammals on the entire planet (MINTUR, 2007, p. 51).

Nevertheless, the Ecuadorian national parks have constantly been threatened, altered and deteriorated by the local human production and consumption systems that surround them. The increase in the demand for land for urbanisation and agricultural uses and the deficient control of the exploitations of natural resources triggered the deforestation of natural landscapes and with thus the destruction of several unique ecosystems. This phenomenon is a reality that has been recognised by the national and local governments, local actors, and plenty of organisations related to environmental conservation and tourism since the 1990s (SENPLADES, 2013; Prieto, 2011; MINTUR, 2007, pp. 50-51; PNUMA, 1997) (Figure 19).

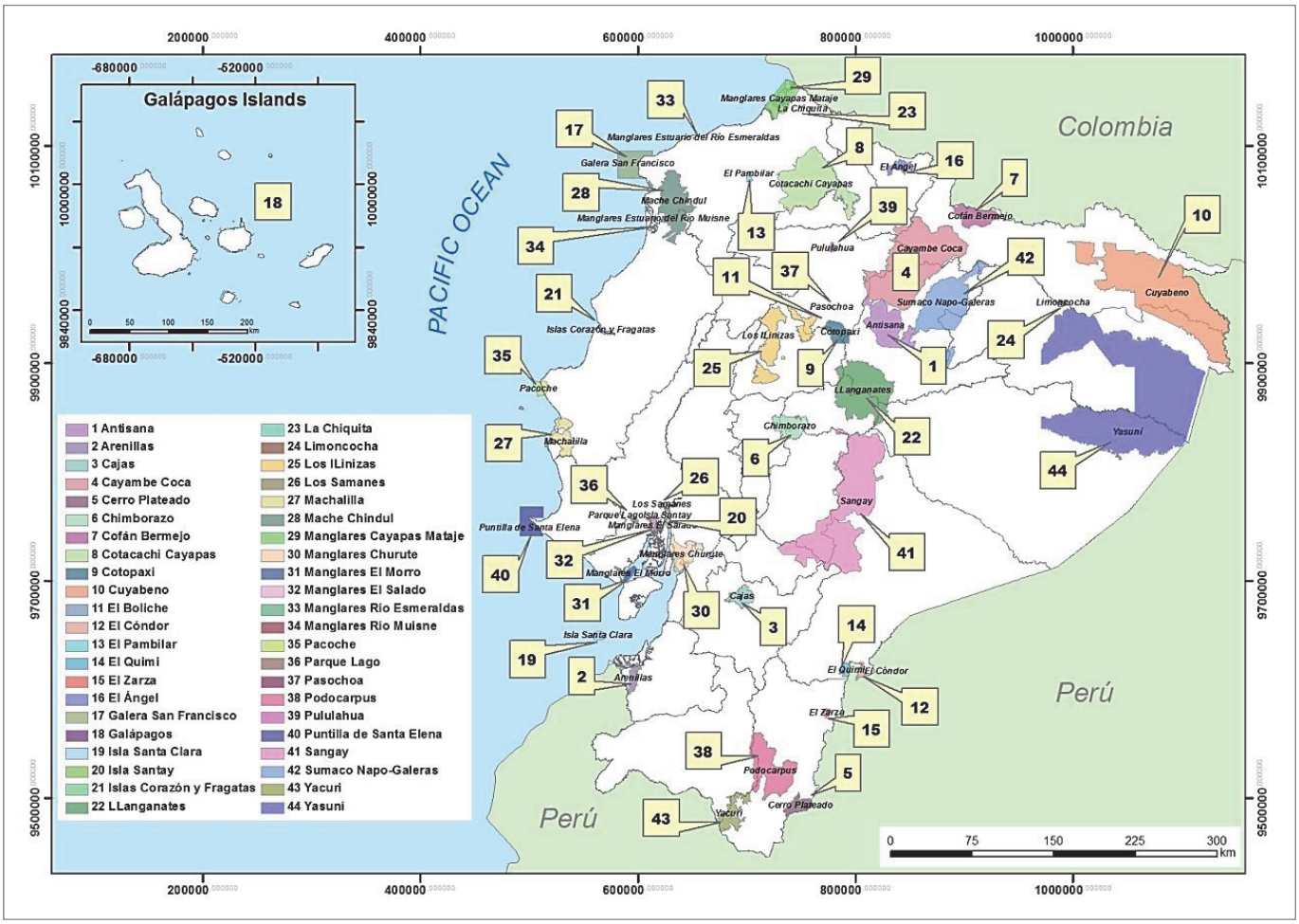


Figure 19: National System of Protected Areas (SNAP) (Source: Own draft based on MAE, 2015)

Figure 20: Spondylus Route in Machalilla National Park (Photo: Pozo, 2015)

Figure 21: Los Frailes beach, in Machalilla National Park (Photo: Pozo, 2015)

5. Geographical restructuring of the central coastal region

In the 1980s the earliest construction of a section of the E-15 state route or *Troncal del Pacífico* was the first step to connecting the traditional fishing towns and villages of the central coastal region with the rest of the country and with the cities of Salinas, Guayaquil, and Manta. The main argument of the national government to focus public investment on the improvement of connectivity in this region was to facilitate the extraction, commerce and transportation of marine and agricultural produce in order to promote local economic and social development in traditionally isolated and socially vulnerable rural settlements (Figure 22).

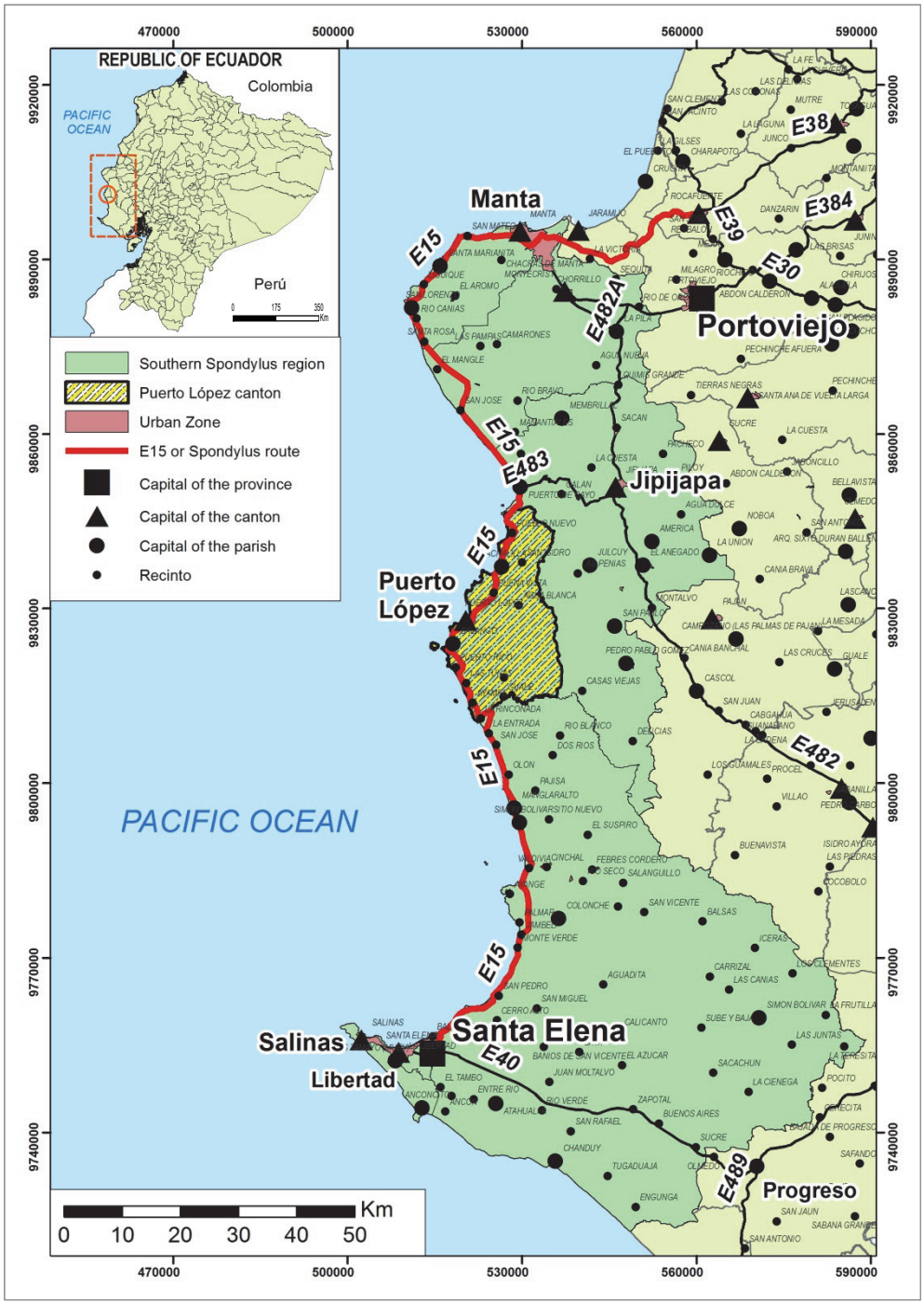


Figure 22: The central coastal settlement system (Source: Own draft, 2014)

The new route signalled the dawn of a new economic geography in the region and became the backbone that interconnected its settlements system. Traditional primary economic activities like fishing and agriculture were able to transport and commercialise their products to the major cities with lower costs and efficiency. Additionally, industrial and manufactured activities related to the marine resources expanded from the northern and southern extreme sides of the Spondylus Route, i.e. from Salinas to the north and from Manta to the south, seeking for new points of extraction. Nonetheless, rural poverty and vulnerability did not decrease as it was expected (INEC, 2010).

The still pristine landscapes, the abundance of natural resources, and the rudimentary ways of life in local coastal communities were the main magnets that attracted the attention of domestic and international tourists and, at the same time, of foreign investors and local elites. Paradoxically, the expected arrival of international tourism to this territory has been destroying, directly and indirectly, their possibility to achieve a real sustainable development. Despite the millionaire public investment on tourist infrastructure and international promotion, the combination between the rise of tourism and the predominance of a weak urban planning provoked the fast and uncontrollable urban growth of these towns with more negative than positive consequences for the inhabitants as well as for the built and natural environments.

As in many other tropical Latin American countries, the Ecuadorian national government and coastal municipalities of the 1990s and 2000s focussed their attention on beach tourism as a new and easy way to provide fast economic development for urban and rural communities. Public investments were focused on the improvement of transport infrastructure along the E-15 and on the promotion of the new called *Ruta del Sol*. Tourist flows coming from the major cities like Guayaquil, Quito and Cuenca spread along the route on summer holidays and demanded basic tourism services like seafood and lodging. Tourism began to amplify the formal and informal job markets in this region and in some specific towns and fishing villages with pristine landscapes and natural resources.

As mentioned above, the debutant socialist government of Rafael Correa proclaimed tourism development as one of the main strategic objectives to promote social and economic development in rural areas and progressively to decrease the traditional Ecuadorian economic dependency on the “black gold”. In addition, nature and biological diversity were included in the new National Constitution (2008) as strategic resources to protect the Ecuadorian new society based on the Good Living (SENPLADES, 2009). According to René Ramirez (2012), the actual state secretary of research, knowledge and technology (SENESCYT) and co-

ideologist of the Civic Revolution or *Revolución Ciudadana*[16], the 21st century Ecuadorian society should be oriented to a "Republican bio-socialism based on a green economy, which will produce biological knowledge and ecotourism as its principal income sources" in 2020 (Ramírez, 2012a, p. 5).

Paradoxically, since 2008 the *green-socialist* national government has implemented an aggressive program of public investment in tourism development in order to increase the arrival of international tourists and to promote the local socio-economic development. One of the star projects was the extension of the E-15 along the central and northern coastline. The new tourist branding name was the Spondylus Route. After having been completely finished completely in 2010 with a total cost of more than 365 million dollars, the 748 kilometres route has nationally and internationally been promoted as the most important tourist corridor of the Ecuadorian coastal region (MTOP, 2011; MINTUR, 2009).

The southern section of the E-15 (Salinas-Manta) is the oldest and most interesting area to observe the socio-spatial transformations which the new economic geography of tourism has triggered in this territory and its settlements system since 1990. International tourism, as a globalisation force, has not only been transforming large and medium-sized cities in developing countries but also rural regions with high levels of biodiversity and settlements systems composed of towns and villages based on artisanal fishing and agriculture (Telfer & Sharpley, 2008). New ways of lives related to the new economic geography contributed to the development of new urban forms and, at the same time, the increase of social inequality and the decrease of local resilience (Pozo, et al., 2014).

This accelerated and uncontrolled process of socio-spatial transformation, from rural towns to small globalised cities, is the main focus of the present research. The area of study is the Southern Spondylus Route Region (SSRR). With a total surface of 5,813 square kilometres, 7 cantons, 7 small tourist cities, more than 100 rural settlements, high levels of extreme poverty and informal labour, a vibrant local economy and a national park (ecological reserve) of more than 350 square kilometres; the SSRR is a growing region with a high potentiality either to be a strategic biodiversity hotspot and a source of local-global resilience, or the victim of its own transformation into a new international tourism enclave with high levels of social vulnerability and inequality.

[16] The *Revolución Ciudadana* or Civic Revolution is the name of the social and political transformation that the current socialist president Rafael Correa has been leading in Ecuador since 2007 until today. For this left wing national government it means the recuperation of the social and political power by the working class, and at the same time, the decrease of power from the local and foreign elites of the right wing. For the political opposition, it is a nationalist discourse of a new type of leftist populism that spread from Cuba to Venezuela, Bolivia, Argentina and Ecuador. They adopted the concept "Socialism of the 21st century" (Dieterich, 2006) as their ideological flag.

5.1. The archaeological and natural heritage behind the landscape

Despite the relatively recent increase of connectivity that the central coastal region experienced over the last two decades, there are thousands of years of history behind its contemporary natural and built landscape. Many centuries ago before the beginning of the first colonial explorations in the 1530s, plenty of organised native tribes and societies had been settled in different points of this region (Lunniss, 2014; Bohórquez, 2012).

Subsequently, during and after the colonial period, artisanal fishing and agriculture remained the main economic activities of the isolated villages and towns (Harris et al., 2004). Nonetheless, it was not after the second half of the 20th century that domestic tourism began to arrive when local elites from the major cities were the first to identify these pristine landscapes as new beach resorts and to demand tourism services (Prieto, 2011).

5.1.1. The ancient communities and traditional ways of life

According to the few, but important, discoveries and documentation made by several foreign and local archaeologists during the last century, this region was the home of diverse tribes and advanced pre-Hispanic societies which have been settling along the coast for several thousands of years. Its geographical location at the convergence of three marine currents of the South Pacific (El Niño, Humboldt, and Equatorial) and the positive influence of them on the continental and oceanic climates has provoked the abundant concentration of nutrients and, as a direct consequence, the rise of biodiversity on land and at sea (Arriaga, 2000). This abundance of natural resources was probably the main reason for the location of the major pre-Hispanic settlements along the Ecuadorian central coast (McEwan, Silva, & Hudson, 2011; Harris et al., 2004).

These ancient fishing and agricultural communities were mainly characterised by their strong relationship to the natural environment (Lunniss, 2014; Bohórquez, 2012; Harris et al., 2004). The *Manteña* was the most representative coastal culture which has been identified in several archaeological sites along the southern Spondylus Route (Salinas – Manta) since the beginning of the 20th century. It was distributed along the Ecuadorian central coast by an advanced network of routes, towns and cities. The *Manteños* were the first natives contacted by the Spanish explorers when they arrived at the Ecuadorian coasts in the 1530s. Essentially, the *Manteños* were communities of fishermen, traders, and great navigators, whose settlements remains date from approximately the 800 – 1530 BC (Martin, 2009; Currie, 1995).

The Ecuadorian archaeologist Stefan Bohórquez (2012) compiled graphically the most significant archaeological remains documented during the last century within the southern Spondylus Route. The majority of these settlements were concentrated near Puerto Lopez and

its settlements system (Salango, Río Chico, Agua Blanca, Los Frailes, and Machalilla) (Figure 23).

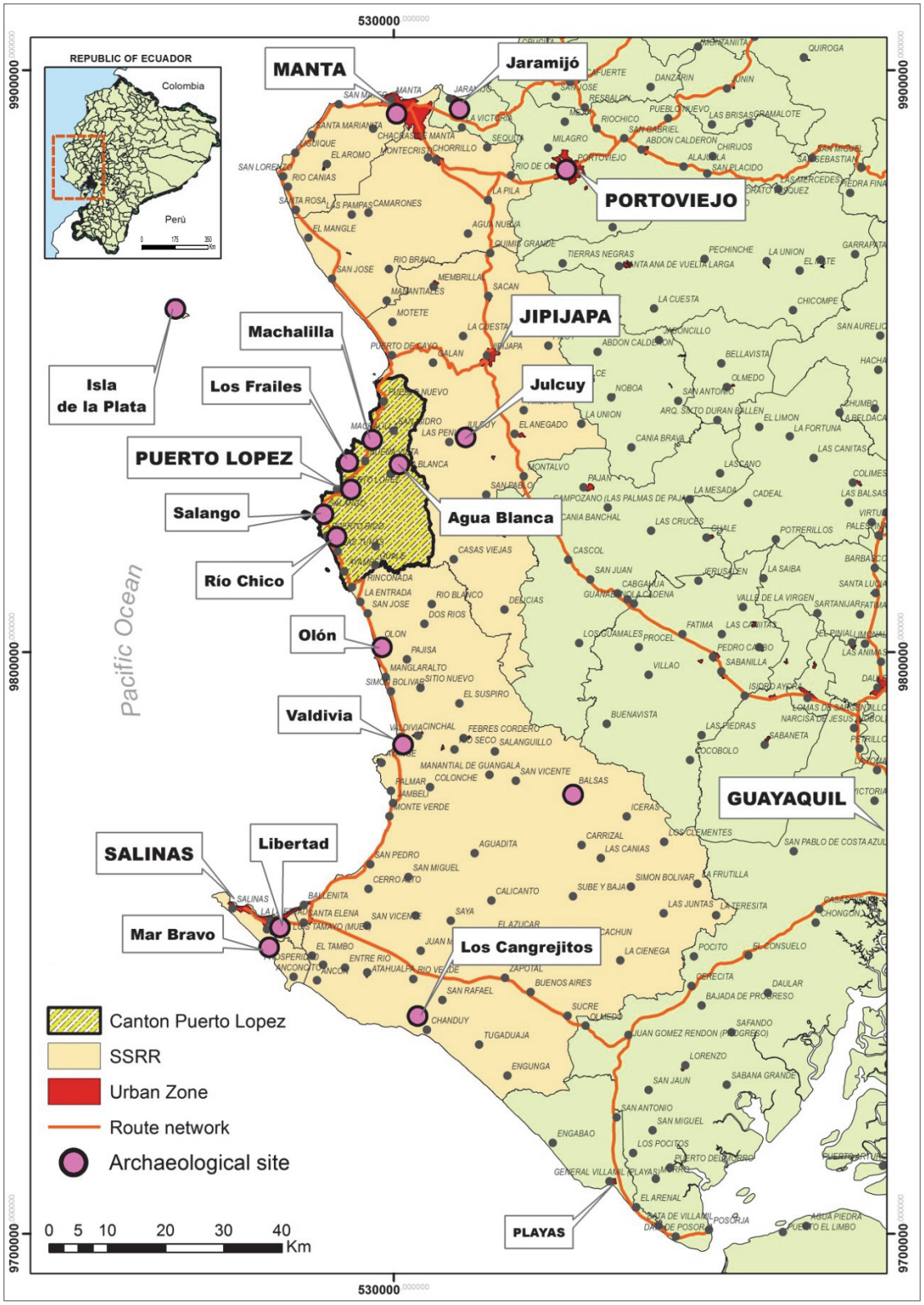


Figure 23: *Manteño* archaeological sites (Source: Own draft based on Bohórquez, 2012, p. 22)

5.1.2. The colonial and republican periods: fishing and agricultural communities

In the course of the following colonial period (1530 – 1830), the city of Guayaquil developed as one of the most important exportation ports and wood shipyards along the southern American Pacific coast belt (Lee & Compte, 1992). In that time, there was not a massive use and promotion of the coastal region for tourist or leisure proposes. Essentially, it was a rural region composed of several small fishing villages and towns. The bad quality of the roads and the lack of transport infrastructure contributed to its physical isolation. In spite of this, the ancient owners of this region left progressively their settlements and spread over the new Spanish cities and economic system (Acosta, 2012; Hidrovo, 2006) (Figure 24).

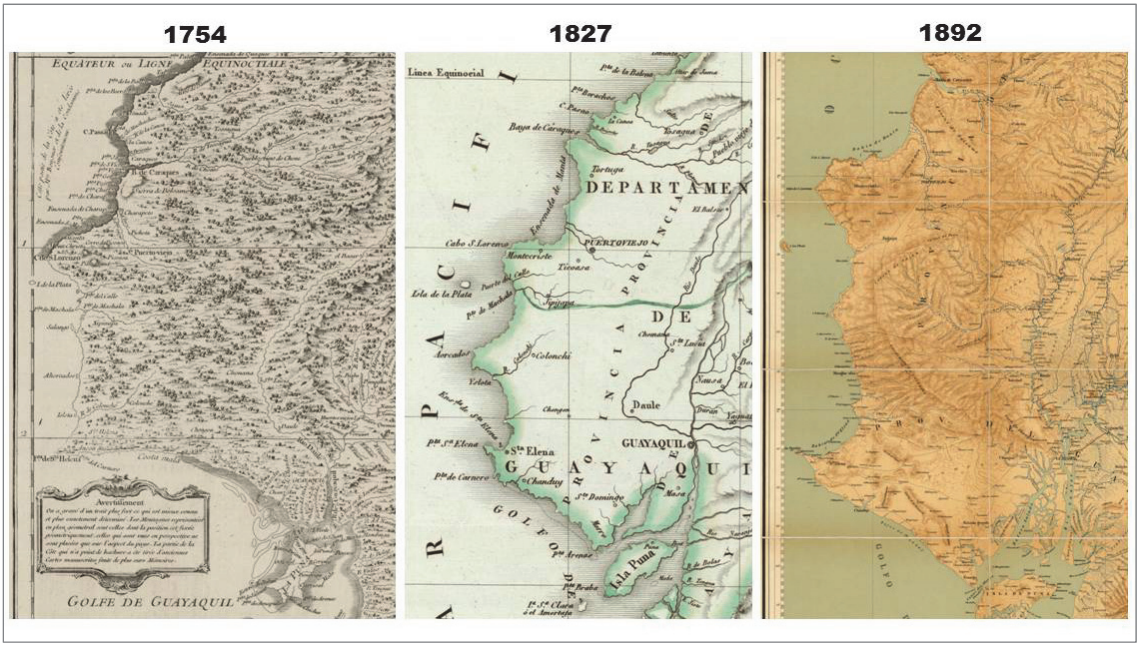


Figure 24: Ancient Geography (1754, 1827, and 1892) of Ecuador (Source: http://www.oldmapsonline.org/)

The Republican era (since 1830) has been characterised by the socio-economic consolidation of the Guayaquilean agro-exporter and financial elites on the top of the social hierarchical pyramid of the coastal region, the extreme impoverishment of the rural areas, and the concentration of people in medium-sized and large regional cities because of rural-urban migration. Guayaquil became again the main urban centre of commerce, formal and informal labour, health and education services (Acosta, 2012; Lee & Compte, 1992). From this vibrant pole of economic development, several routes have been extended across rural areas as veins or roots in order to extract and transport the abundance of fishing, forestry and agricultural produce for local consumption and exportation. The colonial extractive system, which had been criticised and afterwards inherited by the new local elites, was reproduced with better efficiency and within an early capitalism economic system influenced by the Anglophone powers of the 1800s and 1900s United Kingdom and the USA (Acosta, 2012) (Figure 25).

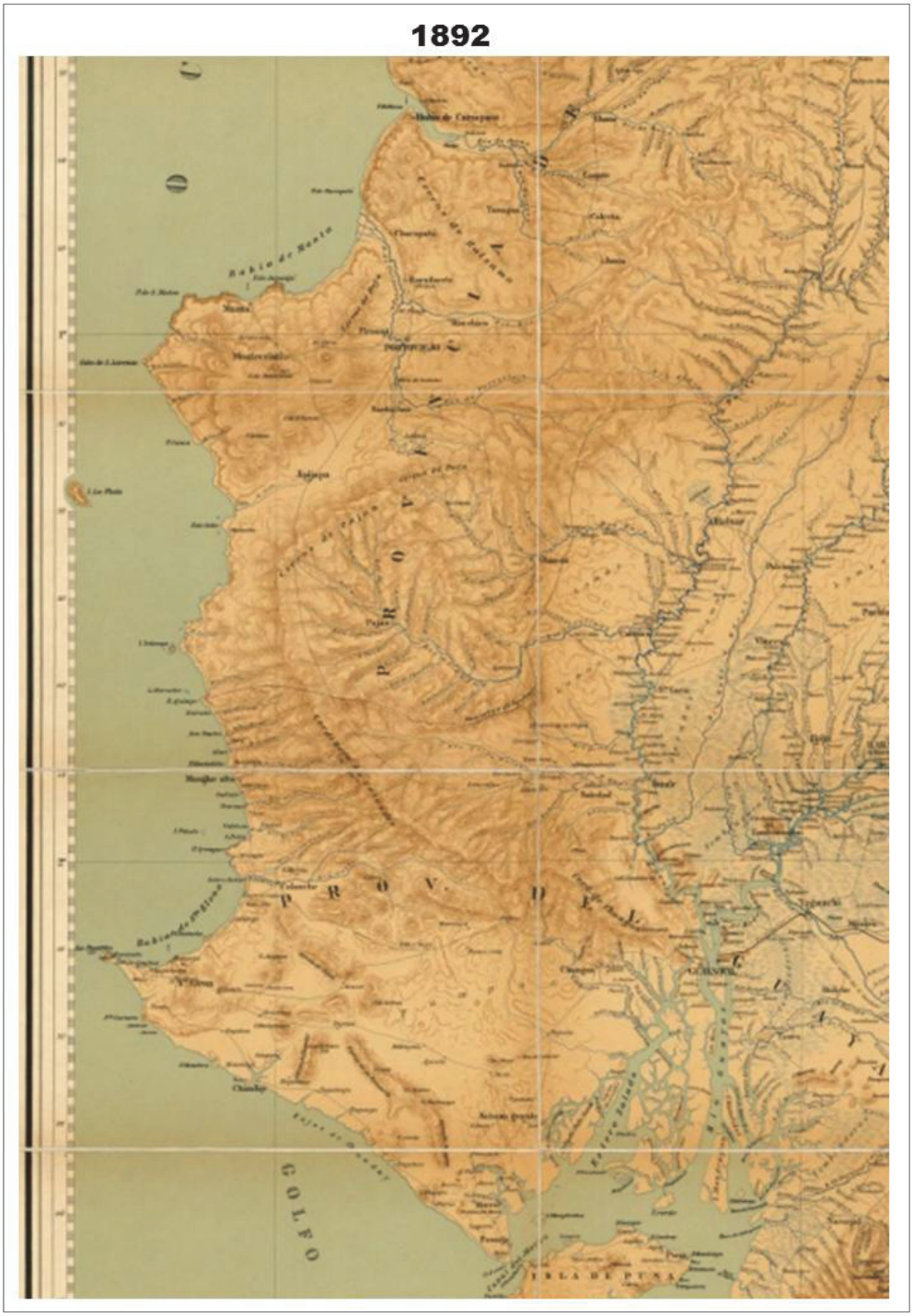


Figure 25: South-central coast of Ecuador in 1892 by Wolf (Source: http://www.oldmapsonline.org/)

The urban growth of Salinas has been closely been related to the tourism and leisure activities of the Guayaquilean elites, especially during the second half of the 20th century. Since the 1950s it has been the main tourist settlement where domestic and international tourists had the possibility to find basic and specialised tourist infrastructure. It has been the traditional beach resort from the high and middle income families of Guayaquil. Local elites built their houses in new neighbourhoods or bought flats in the residential buildings that spread along the Salinas coastline. Manta is situated at the northern end of the SSRR and is the second most famous

Ecuadorian port city after Guayaquil. Since its foundation, its development has always been closely related to Portoviejo, the capital city of the Manabí province. Both grew up in a distance of 35 kilometres from each other, with different but complementary functions. Portoviejo was founded in 1535 by the Spaniards and has traditionally concentrated the regional social and political power. Manta, as the main regional harbour, has been the main entrance and exit door of the international flows of imported and exported products, goods and services (Hidrovo, 2006).

5.1.3. Preservation of the natural heritage: the Machalilla National Park

In 1979, the Machalilla National Park (MNP) was officially created by the national government as part of the program *National System of Protected Areas* or *Sistema Nacional de Áreas Protegidas* (SNAP) (Figure 26).

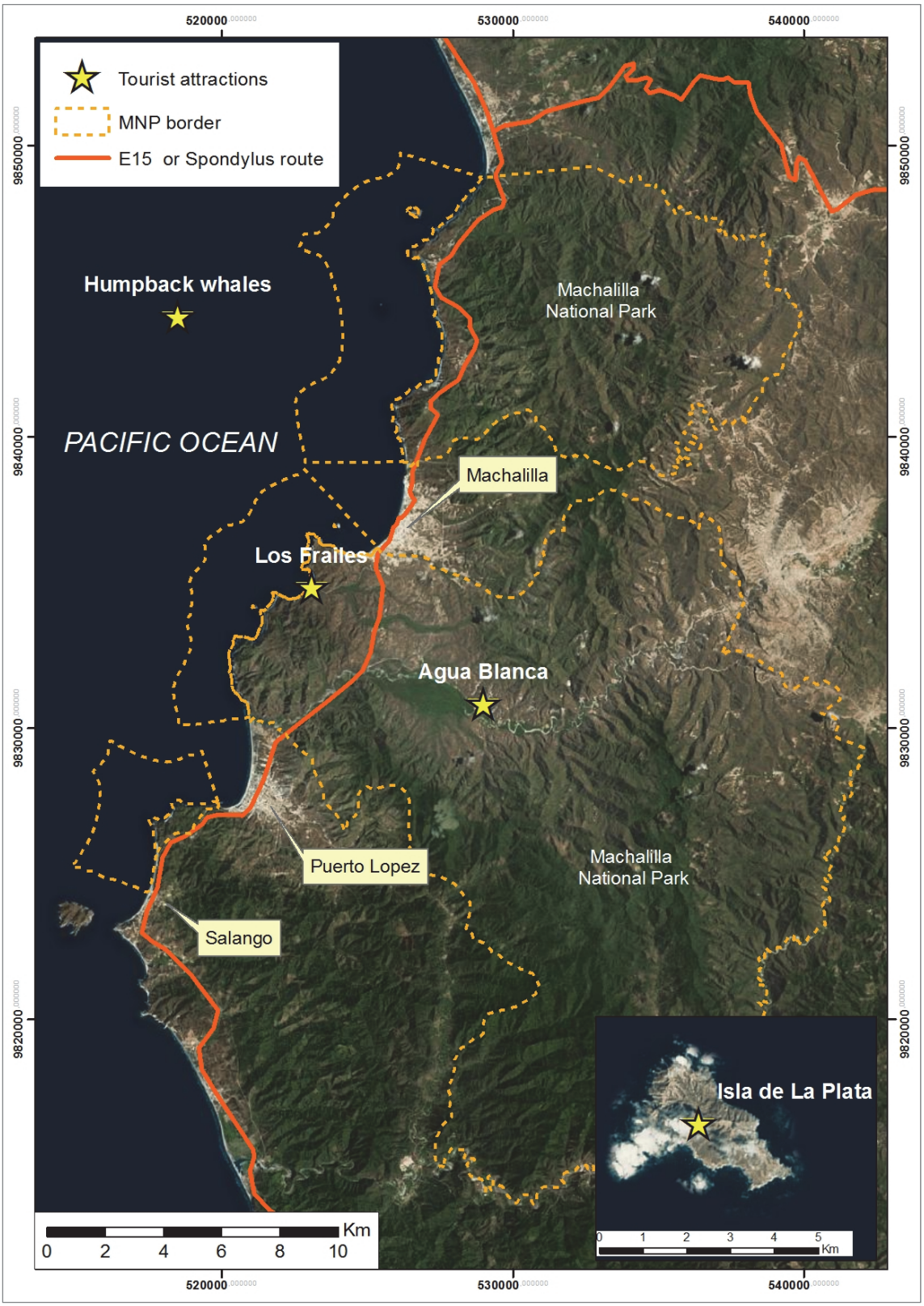


Figure 26: Machalilla National Park (Source: Own draft, 2016 based on ArcGIS Basemap)

The main objective of the declaration was the urgent need to protect the abundant biodiversity that concentrates in its land (dry forest and tropical rain forest) and marine ecosystems (McEwan, Silva, & Hudson, 2011, p. 104). It is localised along the south-central coast of Ecuador and has 56,200 hectares (41,754 hectares of the land surface and 14,430 hectares of marine protected area). Inland, the topography varies between 0 until 800 metres over the sea level. The MNP received its name from the pre-Hispanic culture *Machalilla*, that settled in this territory between the 1800 BC and the 1000 BC, as well as other indigenous populations like Valdivia (3000 BC) and *Manteño - Huancavilca* (AD 1500). Several types of archaeological remains, like housing and ceremonial building structures, cooking utensils, fishing and agricultural tools, clay figures and sculptures, ceramic and lithic pieces, stone monoliths, memorial burials, and many others still not inventoried, are the physical evidence of their presence along the Ecuadorian coast (Lunniss, 2014; Bohórquez, 2012; Harris et al., 2004). The biological diversity comprises several types of flora and fauna from the tropical rain forest and the dry coastal forests (81 types of mammals, 270 birds, 143 fishes, and coral reefs) (MAE, 2007; PNUMA, 1997). Most of these species are at risk of extension due to the past uncontrolled deforestation, fishing and hunting, and contemporary threats related to underdevelopment, urbanisation (pollution) and climate change (MAE, 2007; Arriaga, 2000; PNUMA, 1997) (Figure 27).

Figure 27: Isla de la Plata, subtidal biological diversity (Photo: Jennifer Infante[17], 2014)

[17]Source: http://blog.espol.edu.ec/jinfante/2014/11/09/acuatico/

5.1.4. The Spondylus Route: the backbone of the beach tourism

Spondylus princess is the taxonomic name of the mollusc (seashell) that was identified as an "emblematic and ceremonial object by several American pre-Hispanic tribes" (Martín-Ramos, 2016, p. 3). Along the Ecuadorian coastal region, this seashell was used as a type of currency for the exchanging of products by pre-Hispanic tribes. Based on its symbolism and importance for the ancient civilisations that were settled in this region, the new tourist route was officially named as *The Spondylus Route* or *Ruta del Spondylus* (MTOP, 2011) (Figure 28).

Figure 28: Spondylus Route (Machalilla) (Photo: Pozo, 2015)

When the construction of the southern section of the Spondylus Route was finished at the beginning of the 21st century, the tourist and port cities of Salinas and Manta were finally connected. Even if its main objective had been to improve the rural economic development of this region with the popularisation of summer beach tourism in the major cities like Guayaquil, Quito, and Cuenca and other medium and small-sized towns of the coastal and mountainous areas, the old E-15 contributed to the spreading of tourism along the coastline. Fishing villages and towns began to receive visitors and experienced the demand for tourist infrastructures like hostels, hotels, restaurants, and other complementary services related to commerce, health, security and leisure (Arriaga, 2000).

The Spondylus Route is one of the four main Ecuadorian north-south transport corridors. It has a total length of 748 kilometres and spreads along the north and central coastal region, from the northern town of Mataje to the southern tourist city of Salinas. It is composed of three main sections: the northern, Mataje–Esmeraldas (171 km); the central, Esmeraldas–Manta (347 km); and the southern, Manta–Salinas (230 km). Additionally, it connects three coastal provinces (Esmeraldas, Manabí, Santa Elena, and Guayas), 22 cantons (San Lorenzo, Eloy Alfaro, Río

Verde, Esmeraldas, Atacames, Muisne, Pedernales, Jama, Sucre, San Vicente, Jaramijó, Portoviejo, Manta, Montecristi, Jipijapa, Puerto Lopez, Santa Elena, La Libertad, Salinas, Playas, and Guayaquil), and around 100 tourist towns and cities (Figure 29 and Figure 30).

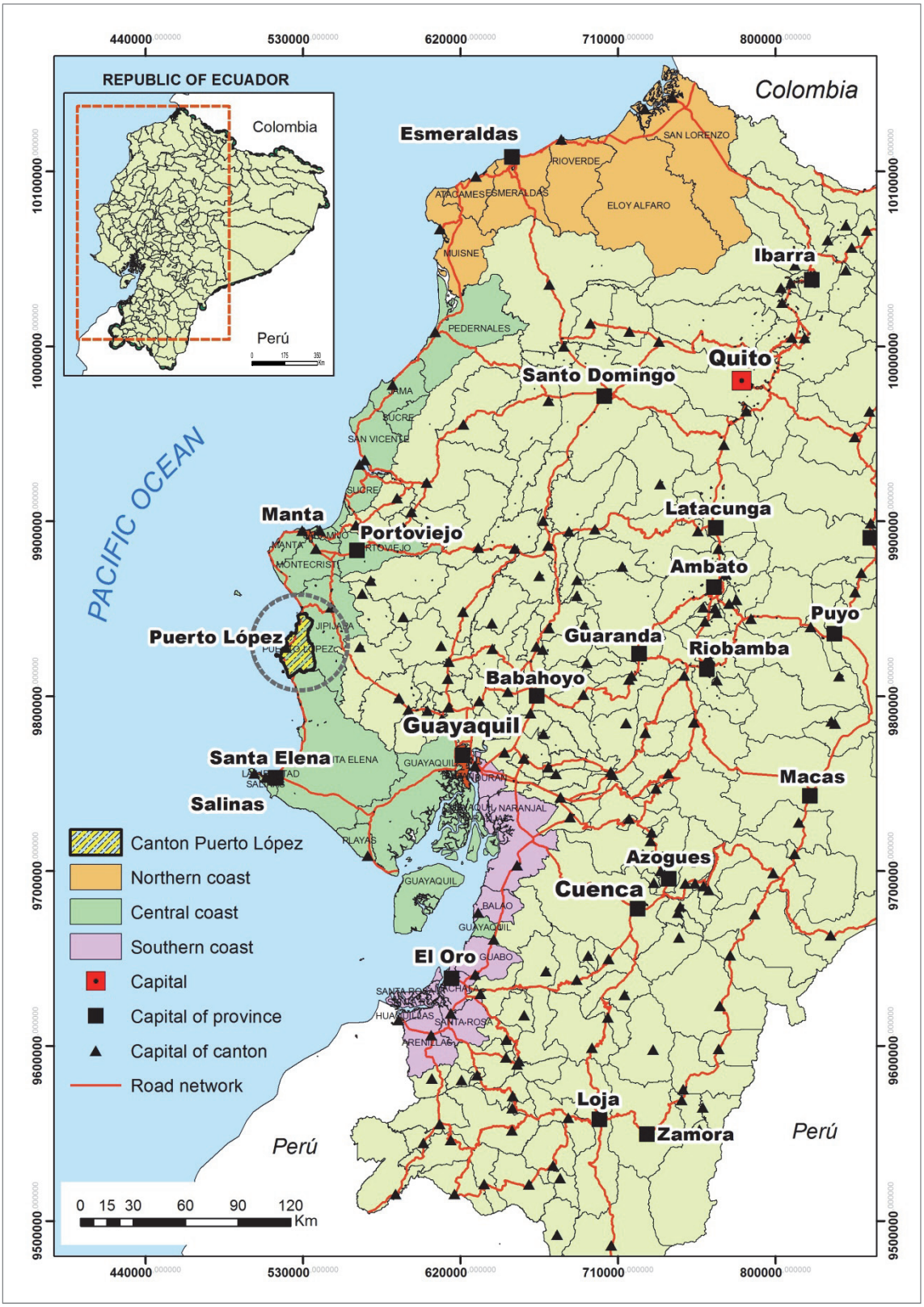


Figure 29: Ecuadorian coastal region (Source: Own draft, 2014)

Figure 30: Tourist map of the Spondylus Route (Source: MTOP, 2013)

5.2. The southern Spondylus Route: exotic landscapes and social vulnerability

The south sector of the Spondylus Route or SSRR comprises seven coastal cantons, which are connected by the E-15 route or Spondylus Route (Figure 31).

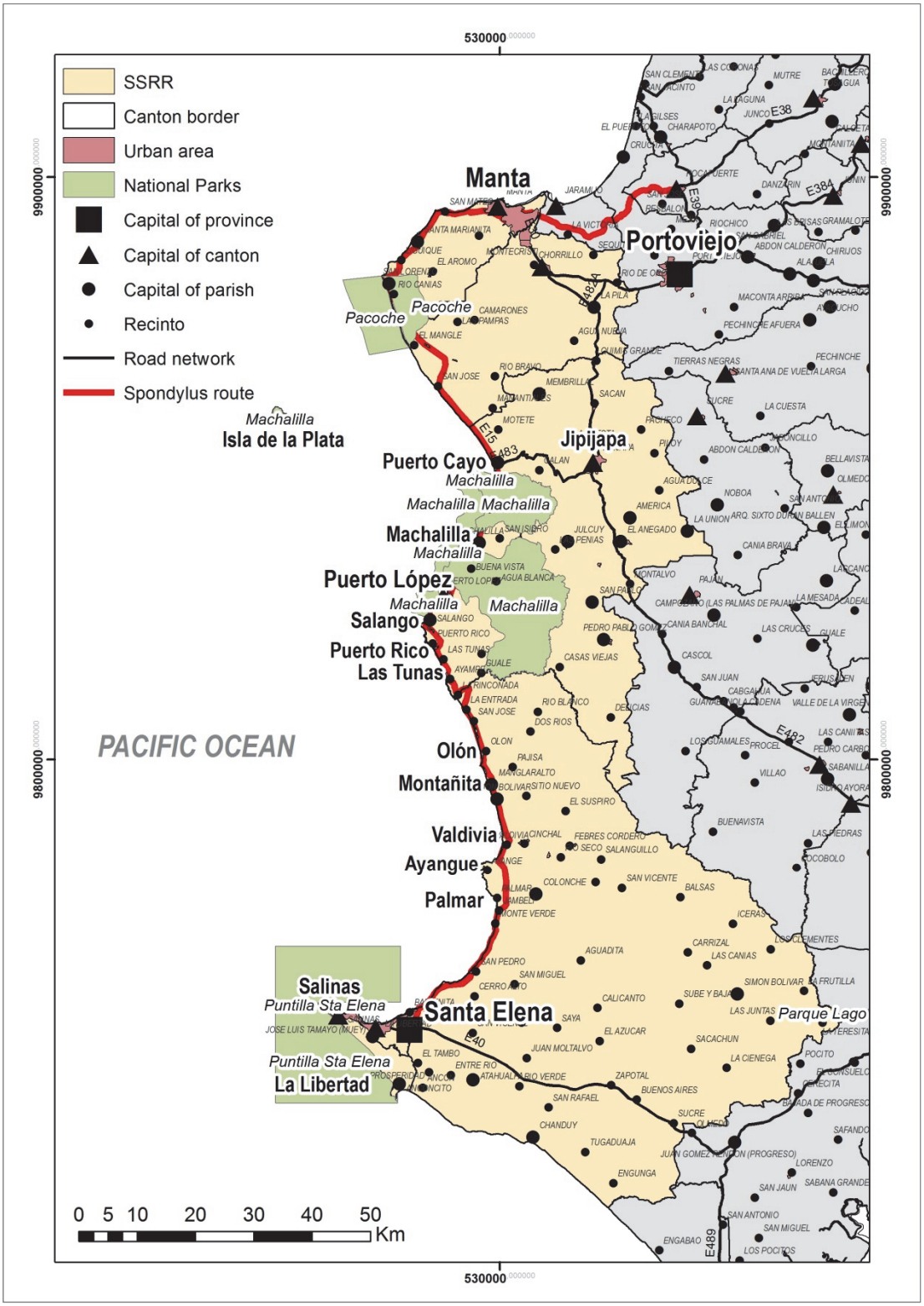


Figure 31: Southern Spondylus Route region (SSRR), Salinas - Manta (Source: Own draft, 2015)

The settlements system of the SSRR is composed of three medium and four small-sized cities which are the capitals or *cabecera cantonal* of their respective cantons, 27 *parroquias*, seven of which are classified as urban and 20 as rural, and more than 100 *recintos* or small rural villages. The Spondylus Route extends along the coast and interweaves the seven cities and other towns. Despite the fact that Salinas, La Libertad and Santa Elena are independent cities, their urban growth transformed them into a small urban agglomeration of 308,693 inhabitants.

Since the middle of the 20th century, Salinas is the tourist destination of the high income families from Guayaquil. In 2010, this conurbation concentrated 44% of the total SSRR population. At the other end of the SSRR, there is another tourist and economic regional node. With 226,447 (2010) inhabitants and the second most important harbour of the country, Manta is a medium-sized city that concentrates important industrial, commercial and tourist infrastructure. Almost in the middle of the route is located, Puerto Lopez. As the majority of towns settled along the seafront, it was a fishing and farm village in the 1950s. Nowadays, it is a small tourist city of 10,928 inhabitants where tourism, industrial fisheries, artisanal fisheries and farming are the main economic activities that fuel the formal and informal local labour market (Figure 32).

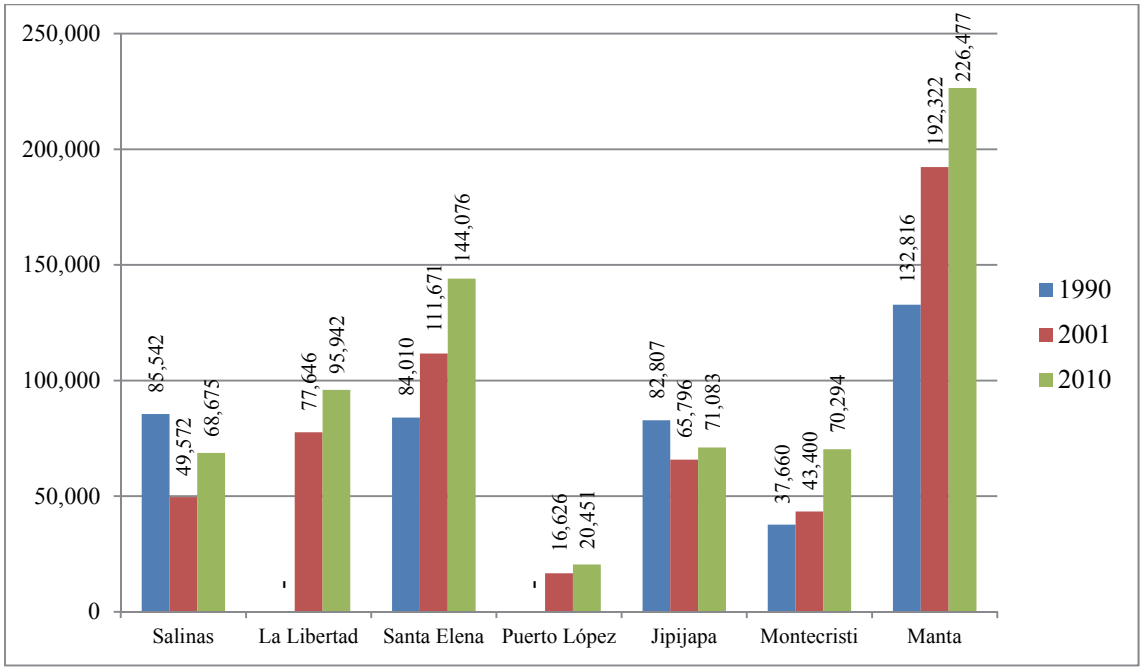


Figure 32: Population in Southern Spondylus Region, 1990 – 2010 (Source: SNI, 2014)

The improvement of the transport connectivity and the increase of the economic activities changed some of these coastal settlements into population magnets that attracted rural-urban migration of low income families from the poor rural surroundings. Small fishing villages like

San Pablo, Montañita, Ayangue, Olón, Machalilla, Salango, Puerto Lopez[18], Puerto Cayo, San Mateo and others, began to absorb the migration of a rural population that settled looking for jobs and opportunities. It caused an intensive demand of new formal and informal residential areas inside and outside the urban limits of these towns (Pozo, et al., 2014).

With local governments that were expecting to receive the social and economic benefits of the new tourism activities, a process of fast and uncontrolled rural-urban transformations was deployed. Fast urban growth and weak urban planning were the main ingredients of the process that joined the new fragments or urban forms in the small coastal tourist cities that structured this region and settlement system. Nowadays, adverse outcomes of their unsustainable urban development could be observed in the deficient physical and functional quality of their urban spaces.

[18] According to the Puerto Lopez PDOT (2011), the first public bus arrived to this fishing village in 1975. Nonetheless, the quality of the road that connected Manta with the southern settlements of the Manabí province was disastrous and only usable in summer seasons. The last reconstruction and improvement of the E-15 has been finished in 2010.

5.2.1. Territorial and urban public management

The territory of Ecuador is politically administrated by four main types of regional divisions with different geographical scales (surfaces and population), levels of power, competencies, and legal responsibilities. On the macro scale are the planning zones (regional) and the provinces (provincial). On a medium scale there are the cantons (cantonal), and on the lowest level, there are the parroquias (parroquial). Since the last reformation of the Constitution in 2008, the Ecuadorian government renamed all of them as GADs or *Gobierno Autónomo Descentralizado* (Autonomous Decentralized Governments). Nowadays, the 257,217 square kilometres of Ecuadorian territory is divided into nine planning zones, 24 provinces, 221 cantons, and 1,149 parroquias.

Putting the new 2008 constitution in operation, new laws and planning tools were created by the state to improve the political and territorial administration of the country. The COOTAD or "Organic Code of Territorial Organization Autonomy and Decentralization" (*Código Orgánico de Organización Territorial Autonomía y Descentralización*) was approved and published as a law in 2010. The main objectives of this law were the strengthening of the role of the state on the different scales of the territory, the promotion of the politic autonomy and decentralisation, the efficient and equitable distribution of the resources, and the restriction of the competencies of the diverse governmental institutions distributed over the territory (Gobierno del Ecuador, COOTAD, 2011).

Also, the COOTAD (2011) establishes clear definitions of the different types of GADs (province, canton and parroquia), their legal competencies in their territories, planning tools and their mandatory minimal content, budgetary allocations, democratic processes to select their political representatives, and others. It is the main territorial law that regulates and norms the activities of the regional, local and sub-local governments in Ecuador (Table 13).

Hierarchy	Type	Territorial unit	Planning tool
1	Planning Zone	Region	Zone Agenda
2	GAD Provincial	Province	PDOT
3	GAD Cantonal / Municipal	Canton	PDOT
4	GAD Parroquial	Parroquia	PDOT

Table 13: Hierarchy of Planning Zone and GADs (Source: Gobierno del Ecuador, 2011)

Regarding planning tools, there was a process of reorganisation and delimitation of their application on the various spatial scales. The Wellbeing National Plan (PNBV) was created by the original plan of government promoted by Rafael Correa to win the presidential election in 2007. It is the national master plan that defines the Ecuadorian objectives, guidelines and goals to achieve a common vision of development during the diverse periods of governments. Since

the election of Correa in 2007 and after his re-election in 2013, two PNBVs (2009-2013 and 2013-2017) have been implemented. The latter is the valid nowadays and establishes the national objectives of development.

Likewise, each province, canton and Parroquia in Ecuador has the mandatory execution order of contracting the studies for the elaboration of a PDOT (*Plan de Desarrollo y Ordenamiento Territorial* – Master Plan for Development and Territorial Planning). It is the ultimate master plan that guides their regional and urban planning, and it has to be closely orientated to the vision and goals defined by the PNBV. The main product of this planning tool is a list of priority plans, programs and projects that the GAD requires to develop every year to achieve his vision of short, medium and long terms economic and social development. The PDOT details the necessary budget to cover these public investments. The national government enacts the budget allocations that each GAD receives each year from the state according to their PDOTs (Figure 33).

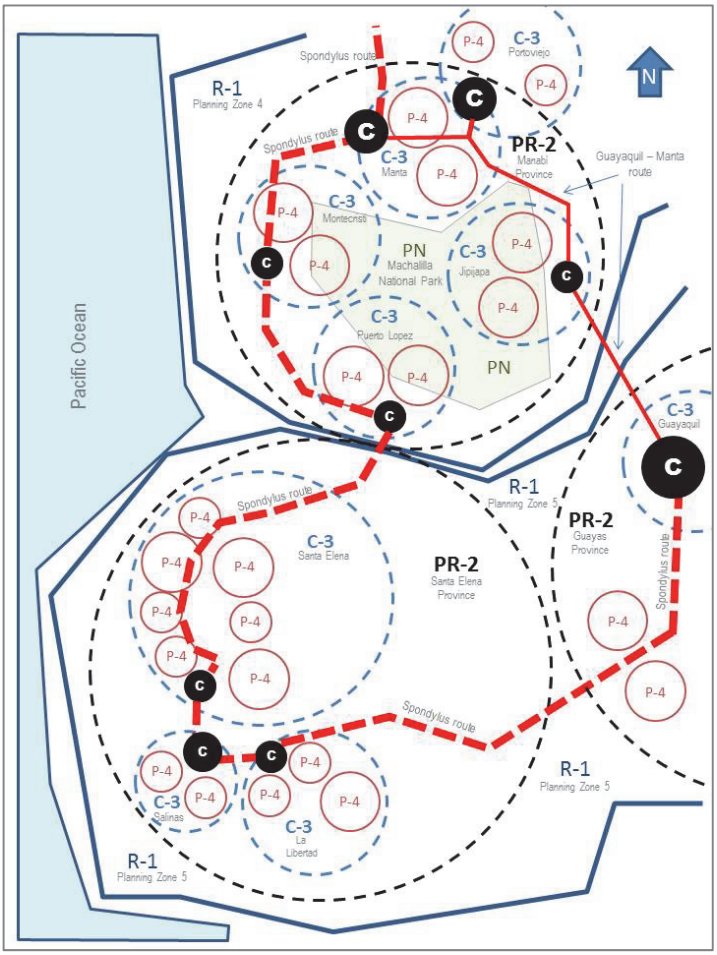


Figure 33: Planning tools operating in the SSRR territory (Source: Own draft, 2016)

Due to the fact that the SSRR is localized in 2 planning zones (4 and 5), 2 provinces (Santa Elena and Manabí), and contains 7 cantons (Salinas, La Libertad, Santa Elena, Puerto Lopez, Jipijapa, Montecristi, and Manta), and 27 parroquias, there are 38 planning tools or PDOTs that

have been implemented with some similarities and convergences in terms of their visions to achieve development.

No.	Planning Zone R-1	Province PR-2	Canton C-3	*Parroquias*/Parishes P-4	Type
1	Planning Zone 5	Santa Elena	Salinas	Salinas (Capital)	Urban
2				Anconsito	Rural
3				José Luis Tamayo (Muey)	Rural
4			La Libertad	La Libertad (Capital)	Urban
5			Santa Elena	Santa Elena (Capital)	Urban
6				San José de Ancón	Rural
7				Manglaralto	Rural
8				Chanduy	Rural
9				Colonche	Rural
10				Simón Bolívar	Rural
11				Atahualpa	Rural
12	Planning Zone 4	Manabí	Puerto Lopez	Puerto Lopez (Capital)	Urban
13				Machalilla	Rural
14				Salango	Rural
15			Jipijapa	Jipijapa (Capital)	Urban
16				El Anegado	Rural
17				Membrillal	Rural
18				La Unión	Rural
19				América	Rural
20				Pedro Pablo Gómez	Rural
21				Julcuy	Rural
22				Puerto Cayo	Rural
23			Montecristi	Montecristi (Capital)	Urban
24				La Pila	Rural
25			Manta	Manta (Capital)	Urban
26				San Lorenzo	Rural
27				Santa Marianita	Rural

Table 14: Cantons and parroquias of the SSRR (Source: SNI, 2014)

With the growth of tourism in the region as an important economic activity, the long-term visions of development in several PDOTs were oriented to promote tourism as one of the most important keys to achieving the expected economic and social development. After the last elections of mayors and other public authorities in 2014, new and updated PDOTs have been developed on all different levels. Nevertheless, the focus on tourism as the key to local social and economic development is still present. In the majority of cantons, the public investment in tourist infrastructure and roadways is equally important as the provision of essential services or the preservation of natural and historical heritage.

An uncertain outcome of this tendency could be the over-concentration of public investments in plans, programs, and projects designed to attract domestic and international tourists, instead of public infrastructure related to basic social needs like potable water or sewage systems. In several rural and urban settlements, where poverty and vulnerability skyrocket in stratospheric levels, it could mean widening the social gap of inequality instead of investing in economic reactivation (Pozo, et al., 2014) (Table 15).

Canton	Planning tool	Vision of development	Planned future public investment according to PDOTs
Salinas	PDOT, 2014-2019	In 2024, Salinas will be a tourist icon of external regional and national production. It will feature infrastructure and equipment that will provide greater mobility, internal connectivity and contribute to the sustainable and integrated development between the cantons of the province Santa Elena. People will be the managers of changing social, cultural, economic, and political institutions through projects and programs of the free governments. These changes will improve the quality of life of the population, as well as respect the guidelines of the Constitution and the Plan National Good Living.	No information.
La Libertad	PDOT, 2012-2020	In 2020, La Libertad will be the integrating axis of the Province of Santa Elena with the active participation of citizens. It will be the centre of the main commercial activities, port, banking, tourism and craft. Likewise, it will be a territorially equitable, secure, and supportive Canton with a model of Sustainable Human Development, which promotes the achievement of Good Living and becoming thus the engine of cantonal and provincial progress.	No information.
Santa Elena	PDOT, 2011-2016	Santa Elena will be a Canton that sells what it produces as well as preserves and renews its natural resources, which plans the land for the harmonious and integral development. It will be equipped by a local government that has a guarantee for development based on its old communal management and associativity.	No information.
Puerto Lopez	PDOT, 2014-2019	In 2020 Canton Puerto Lopez is a benchmark of development based on an equitable economy, where efficient production systems are looking at the tourist, ecological, natural, cultural, fishing, commercial, and agricultural areas. It has an organisational system that ensures citizen participation in all instances in an atmosphere of full respect for human rights and nature. It is an inclusive society that develops in a healthy and safe environment that provides opportunities for all sectors, giving priority to those groups that need more attention. Promotes safe living with the environment by using resources in a sustainable and responsible form, especially in the conservation of water sources. Human settlements occur in certain territories and have the infrastructure, basic services, and social quality. The roadway network allows proper circulation that complements the productive apparatus.	Budget 2014 – 2019: 11.7 million US$ Environment-Biophysics: 61.04% Socio-cultural: 3.15%. Economic: 2.38% Politic-public participation: 15.62% Human settlements: 8.80% Mobility, energy, communication: 9.01% Source: (GAD Municipal Puerto Lopez, Plan de Desarrollo y Ordenamiento Territorial, 2015, p. 284)
Jipijapa	PDOT, 2011-2016	Jipijapa 2021 guarantees its citizens a full development by covering quality services, implementation of plans, programs, and projects that make economic, productive, tourist, ecological, natural, cultural potential canton with a system territorial established and consolidated, based on the articulation of citizen participation with their representatives through the various legal authorities, leading to the fulfilment of good living in a healthy environment and healthy environment.	Budget 2011 – 2016: 344.12 million US$ Environment-Biophysics: 49.2 million US$ Socio-cultural: 40.5 million US$ Economy: 31.7 million US$ Politic-public participation: 15.62% Human settlements: 3.6 million US$ Source: (GAD Jipijapa, PDOT 2011-2016, p. 266).
Montecristi	PDOT, 2011-2016	In 2016, Montecristi promotes the proper management of natural resources, through appropriate land use planning and a road infrastructure in good condition. Promotes agricultural, industrial, and handicraft economic activities of population centres provides access to basic services, utilities and sanitation services and infrastructure. Likewise, it promotes an optimal quality of service in the education and health sectors, as well as expands connectivity and mobility with transport and telecommunications for the proper life of *Montecristenses*.	Budget 2011 – 2016: US$ 46.65 US$ Source: (GAD Montecristi, PDOT 2011-2016, p. 160).
Manta	PDOT, 2012-2020	Manta will be the International Maritime Pacific Harbour connected by an excellent road structure with the rest of the country, where urban nodes are articulated and differentiated. It will be an important directional centre in the microregion of Manabi and the central macro region of South America. It will be an intercontinental maritime and aerial port, as well as the most important industrial fishing centre and tourist resort of the country and the world.	No information.

Table 15: Development visions from cantons along the Spondylus Route (Source: SNI, 2015[19])

[19] Source: http://sni.gob.ec/planes-de-desarrollo-y-ordenamiento-territorial.

5.2.2. The intensive struggle between the built and natural environment

The south-central coastal region contains within its territory two types of natural landscapes: the tropical dry forest and the moist tropical forest. Due to its geographical location at the ICZ (Inter Tropical Converge Zone) this region concentrates high levels of marine and land biodiversity. The encounter of three oceanic currents (the southern cold Humboldt, the northern warm El Niño and the Equatorial) in front of this geographical area produces an abundance of marine live and nutrients. Additionally, the SSRR hosts the Machalilla National Park, which is the last Ecuadorian coastal natural reserve that still survives despite the intensive pressure historically provoked by the expansion of the urban and agricultural borders along the coastline (Arriaga, 2000).

According to Hannah et al. (2013), the tropical western South American coastal border (Colombia, Ecuador and Peru) is one of the most important global biodiversity hotspots and is at extreme risk of habitat sustainability loss. This region will be strategic for the improvement of global resilience against climate change effects in the 21st century (Hannah et al., 2013; Figure 34 and Figure 35).

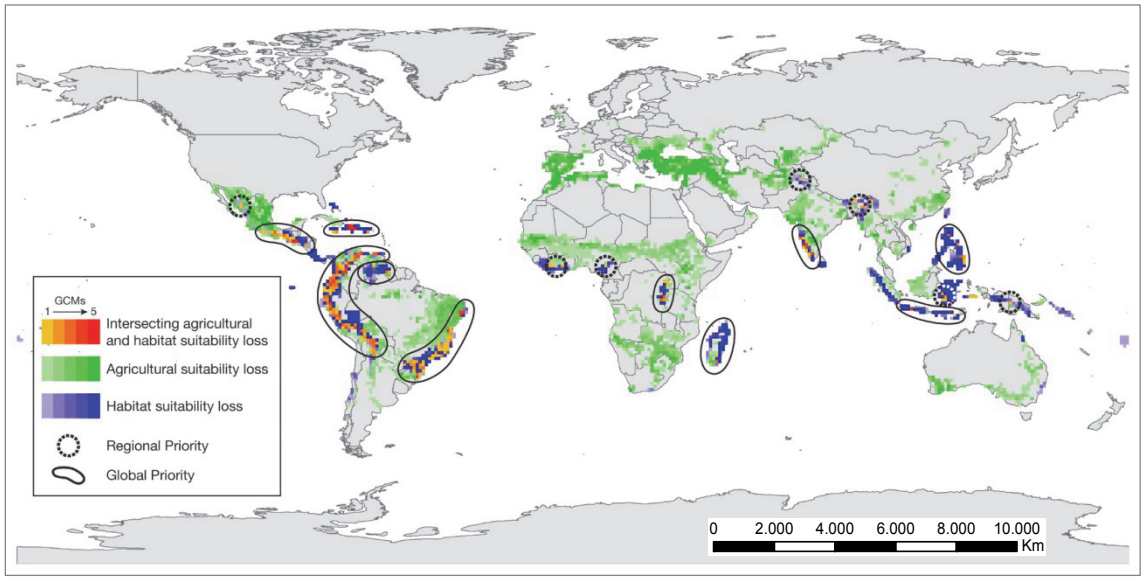


Figure 34: Critical global biodiversity hotspots to preserve (Source: Hannah et al., 2013, p. 4)

The deforestation of the coastal region (Salinas – Manta) was more intensive during and after the Colonial period when Guayaquil was one of the most famous wood shipyards and port of the south Pacific American Ocean. From the 14th to the 18th century, the demand for high quality wood (like the *Guayacán* and *Laurel*) by naval industry and housing construction in Guayaquil contributed to the accelerated deforestation process of the SSRR (Arriaga, 2000). Nowadays, the Machalilla National Park is a small remembrance of the huge natural landscapes of the wet and dry coastal forests from old centuries.

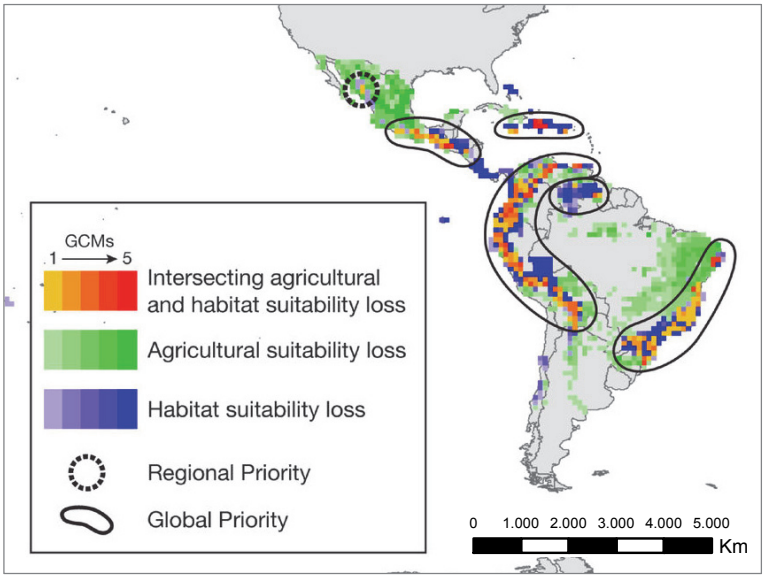


Figure 35: Intersecting agricultural and habitat suitability loss (Source: Hannah et al., 2013, p. 4)

The unsustainable and socially unequal development of these regions is a significant negative impact that has been constraining the possibility of achieving effective biological diversity conservation. In the case of the Ecuadorian coastal region, the SSRR is an obvious example of the contemporary struggle between ecological conservation and human development. The high levels of poverty and public abandonment experienced by the rural coastal region for the last 20 years contributed directly to the irrational and informal exploitation of natural resources as a simple way to survive (Harris et al., 2004). According to Acosta (2012), the Ecuadorian national governments of the last three decades have been unsuccessful in avoiding oil dependency and *extractivism*[20] of primary products (bananas, cacao, coffee, fishing, and processed seafood) as the main modality of capital accumulation (Acosta, 2012).

International and domestic tourism has been perceived by natives and local governments as an efficient trigger of economic development due to the increase of informal jobs opportunities for poor and not-qualified workers (Pozo , Ramírez, Saltos, & Vargas , 2014). Nevertheless, not all the expectations have been materialised, and the ecological impacts are alarming. This vulnerable socio-economic context fuels the risk that tourism, as an economic activity, becomes a new economic monoculture, especially for the informal labour market. The main consequences are the increase of social inequality and dependency; the destruction of natural landscapes, biodiversity, and resources; and the rise of vulnerability and exposure to the effects of climate change. The latter external threat is probably the most destructive.

[20] As a noun, the word extractivism or *extractivismo* does not exist officially in the English and Spanish dictionaries. Nevertheless, it is used to express the "modality of economic accumulation that began to consolidate massively with the European conquest and colony, which imposed economic activities that extract huge volumes of no-processed natural resources (or less-processed) for exportation. Extractivism is not only limited to minerals or petroleum. There are agrarian, forestry and even fisheries extractivism" (Acosta, 2012, p. 412).

According to the last report about global warming, one of the most significant consequences of climate change is the increase in the incidence and intensity of natural disasters (Habitat, 2013). Additionally to the risks of earthquakes, tsunamis or volcanic ash, which historically have menaced the coastal region, *El Niño* and *La Niña* phenomenon should be added to the list. It is expected that the change of the ocean temperatures will increase the periodicity and intensity of floods and droughts along the South American Pacific coast. Due to this fact, the improvement of resilience in rural areas should be of national and global priority.

In the coastal towns, the level of physical vulnerability[21] has traditionally been high for decades, but with the rapid and uncontrolled urban growth triggered by international tourism, it increased remarkably. Particularly the combination of high levels of exposure due to the deficient quality of the self-constructed dwellings in dangerous locations and the increased intensity of hazards related to climate change (ENSO phenomenon, floods, landslides, high tide), enhanced the fragility of families in low income neighbourhoods.

In each rainy season families localised on risky slopes and land strips liable to flooding have to abandon their wood-made houses and their belongings to survive. Additionally, due to the illegal and precarious conditions of the houses, they are not feasible to be insured. This volatile situation directly affects the quality of life of the families and produces million dollars costs for reconstruction or relocation. In the end, the new economic geography prompted by tourism could be indirectly undermining the already weak capacity of resilience of these towns. This assumption could be the *Achilles heel* of the deep-rooted regional and local visions of tourism as the panacea for development.

[21] "Physical vulnerability is defined as the relation between the intensity of the hazard to the degree of damage of an exposed element" (*Safe and Resilient Cities*, World Bank, 2014).

5.2.3. Poverty and social inequality

Extreme poverty in Latin American rural coastal regions has been a constant fact for the last decades (Arriaga, 2000) and is a direct outcome of the extreme levels of social inequality in developing countries like Ecuador (Wong, 2013). In the case of the SSRR, there is a huge gap whether the families live in urbanised or in less-urbanised settlements. Measuring poverty using the index of Unsatisfied Basic Needs (UBN)[22], which has officially been applied by the Ecuadorian Government since 2010 (SENPLADES, 2009), allows observing the dramatic contrasts between rural and urban areas.

In 1990, the Ecuadorian National Population and Housing Census showed dangerous levels of extreme poverty (UBN) of more than 90% in almost all the SSRR cantons, both urban and rural. Manta was the only exception with a UBN index of 75.28%. In 2001 and 2010, all the cantons experienced a decrease in urban and rural poverty. Nonetheless, it was not a dramatic decrease for Santa Elena, Jipijapa, Puerto Lopez and Montecristi. Especially in the latter two, poverty did not fall under the 90% mark (Figure 36).

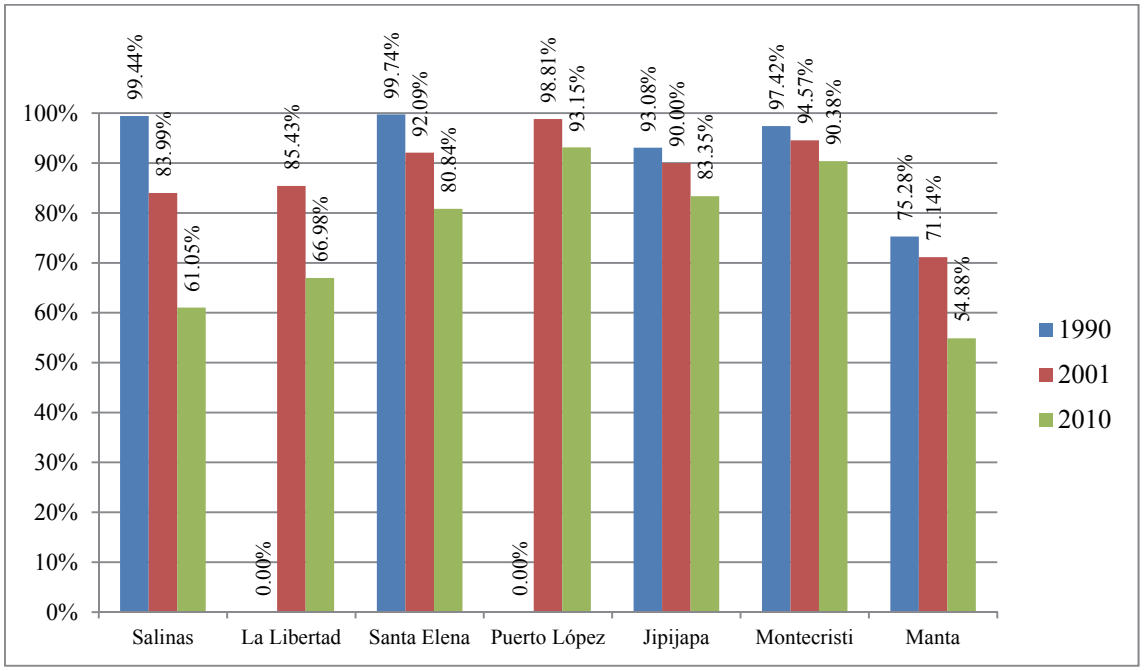


Figure 36: Poverty by UBN (Urban and Rural) 1990 - 2010 (Source: SNI, 2014)

A high percentage of families living in poverty (UBN), is one of the main features of the Ecuadorian rural regions, where their settlements have been historically forgotten by the national and local public administrations. In this case, the range between 50% and 90% of the population living in extreme poverty for more than 20 years is clear evidence.

[22] The Unsatisfied Basic Necessities index (UBN) is defined as the percentage of persons who cannot access to one or more of the following basic necessities: (1) Physical quality of the house, (2) Availability of the house of basic services like piped potable water and sewerage system, (3) Attendance of children to school, (4) Education and occupation of the father and mother, and (5) Overcrowding of the house (SNI, 2014).

This assumption would become extremely annoying if the exploited profits and natural resources extracted from this region for decades are quantified and contrasted with the real quantity of net public and private currencies reinvested in the social development of the area. At this point, the main question arises: How could a natural-resources-wealthy region like the SSRR be one of the poorest and most vulnerable of the country, and probably of Latin America? The numbers given so far change dramatically when broken down to urban and rural areas. On the one hand, urban areas experienced a decrease in poverty (UBN) over the last two decades because public investments in basic services (potable and piped water, sewerage, and others) have been focused in urban areas[23] and specifically in the most connected, and populated settlements (Figure 37).

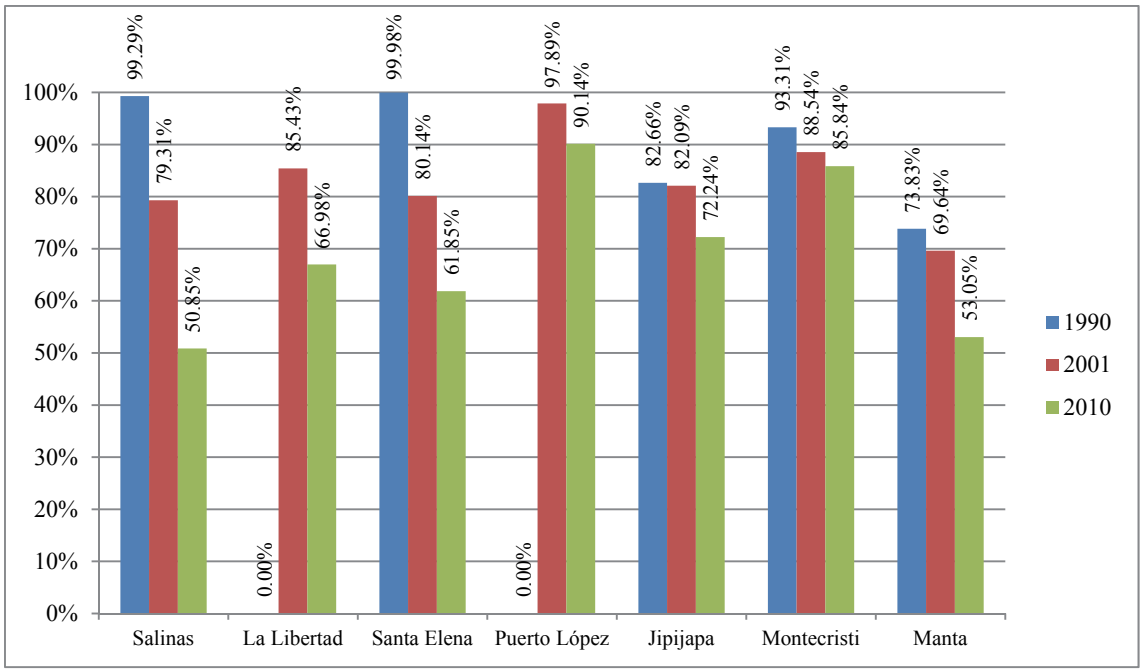


Figure 37: Poverty by UBN (Urban) 1990 - 2010 (Source: SNI, 2014)

On the other hand, the decrease of poverty (UBN) was extremely low in rural areas. For 20 years, Puerto Lopez, Montecristi, Jipijapa, and Manta could not reduce it by more than 2%. Santa Elena and Salinas were more successful with 11.63% and 28.44% respectively. This low decrease contrasts strongly with the national reduction of poverty (UBN) of 19.12% in urban areas and 13.60% in rural ones (Figure 38).

[23] In the case of the SSRR urban areas are considered as the settlements and towns with a political-administrative role in the region (cantonal capital, parish capital) and a minimal total population of 2,000 (Gobierno del Ecuador, 2011).

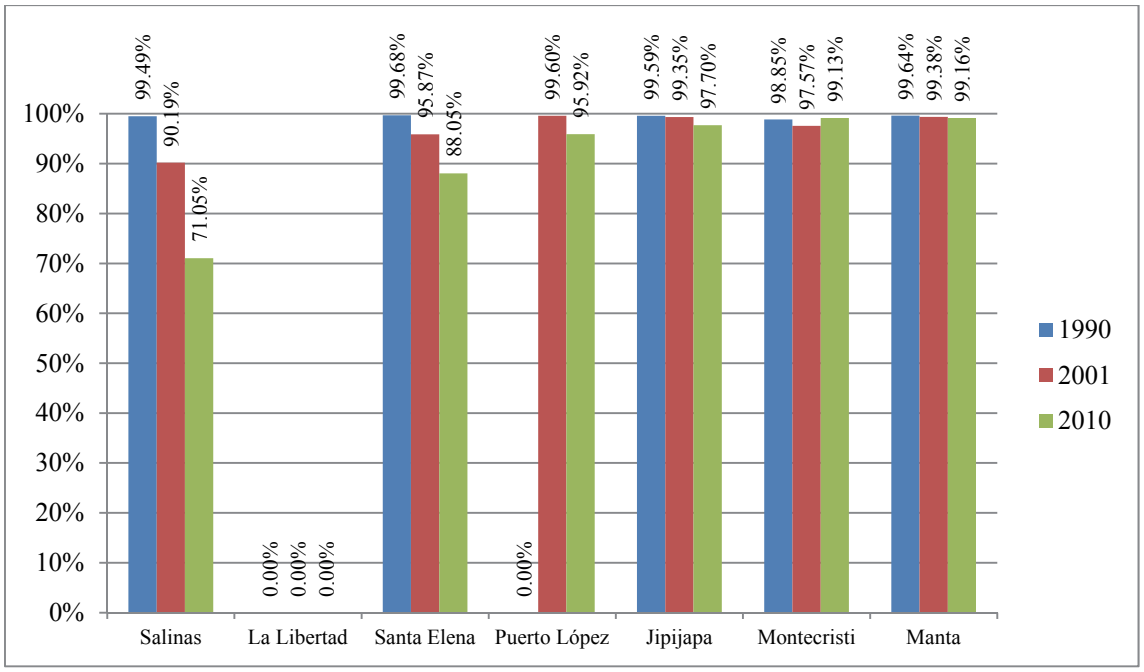


Figure 38: Poverty by UBN (Rural) 1990 - 2010 (Source: SNI, 2014)

The accessibility to essential services, the quality of the houses and the accessibility to health and education are the most important variables for measuring poverty by the UBN index (INEC, 2010). In the case of the rural settlements, the accessibility to basic infrastructure depends on three main factors: (1) the quantity of available public investment (which is always low because of the lack of formal incomes like taxes and the oversupply of national social subsidies); (2) the number of inhabitants, i.e. the number of voters; and (3) the urban morphology of the settlement. The first and the second one are self-explanatory factors. The latter one operates according to a well-known local reasoning by local public administrators: The most dispersed houses there are, the more expensive is the construction of the core infrastructure due to longer distances of potable water and sewerage pipelines (Pozo, et al., 2014).

In other words, mayors invest the few public resources on the most populated and physically concentrated settlements in order to collect votes for the next elections (Pozo, et al., 2014). This informal mechanism has been usual in rural and even urban areas (slums) of the developing world. It could be understood as a type of populist practice (changing basic infrastructure against votes) or as a strategic form to manage the economic resources in low income local governments. Nevertheless, it is a fact that this old and informal mechanism has been reproducing the poverty cycles in rural areas and has increased social inequality and dependency. Generations of farmers and fishermen lived their entire lives in this context, where the acts of just waiting to receive something and accepting whatever is given (no matter what) are the constant of a common way of life (Figure 39).

Figure 39: The "drop by drop" provision of basic infrastructure (Photo: Pozo, 2012)

The "drop by drop" provision of basic infrastructure in rural settlements is an old but effective strategy to maintain the sequence of social dependency to local governments and an easy form of becoming votes for many following elections. The never-ended potable water distribution system projects, the slow destruction and reconstruction of streets or sideways in order to collocate the new sewerage pipelines, and other typical examples of inefficiency are part of the daily urban image in these towns. Some basic infrastructure projects could be developed during several years with a well-planned step-by-step distribution of public budgets and timelines (Pozo, et al., 2014).

For the last forty years, local governments in rural regions like the SSRR have based their social and political power on this strategic management of the public budget, which in several cases is mainly on a 70% grounded by state funds (El Ciudadano, 2014; Ayala, 2013). "The local governments of Ecuador, independently of their quantity of population, do not generate own economic resources and the majority depend on of transfers of the national government" (Oyervide Tello, 2012, p. 102).

From this economic dependency, ensues an increased vulnerability of local governments. This could be seen in the last oil-price crisis experienced by Ecuador at the end of 2015, as the national budget is mainly financed (35.83% of the GDP in 2010) by the oil exportation currencies (Acosta, 2012). Local governments depend politically and financially on the national government, due to the lack of public financial sources. The predominance of informality on the labour market, as well as commerce and other economic activities, and the oversupply of

governmental subsidies (because of poverty) have been traduced on a marginal collection of municipal fees and taxes (Oyervide Tello, 2012).

Puerto Lopez is an example of the constant reproduction of this informal system that has been annihilating any possibility of development. Since its official designation as Canton with an independent municipality in 1994, the situation of underdevelopment in this coastal town has not changed substantially. Despite the considerable local economic dynamics fuelled mainly by artisanal fishing and tourism during the last two decades, the urban image of Puerto Lopez produces a strong contrast to the eyes of visitors and foreigners.

The first visual impact experienced by a visitor is the poor quality of streets and sidewalks, which are extremely deteriorated during the rainy season. Streets of the Downtown accumulate mud and craters with dirty water appearing to be motocross tracks. Tourists and natives seek to follow the sidewalks not to get their shoes and sandals dirty. Cars and motorcycles drive slowly due to the irregular surface but disrespect pedestrians and traffic signals. A group of stray dogs cross the streets without a clear direction, just following the rests of fast food and garbage bags that they find at the corners or accumulated at the foot of old lamp posts (Figure 40).

Figure 40: Muddy streets in Puerto Lopez (Photo: Pozo et al., 2014, p. 48)

At the next block a large longitudinal excavation like a military trench, enclosed by a yellow security plastic tape, shows to visitors and natives that the local government is working on the construction of the first piped water distribution system. Like 20 years ago, water tankers (trucks) still distribute and sell potable water to houses, hotels and lodges. Every litre of

drinking water in this tourist town is more expensive than in the major cities like Guayaquil or Manta, but the quality is poorer. The percentage of families with accessibility to piped potable water (60.42%) and sewage system (0.52%) is simply marginal (INEC, 2010).

In 2010, 90.39% of the inhabitants had access to electricity, but the quality of the service is deficient. Blackouts are frequent, and energy fluctuations provoke the damage of electrical appliances, and fires caused thereby destruct the low income wood houses. There is also a high percentage of informal connections to the public electric system in residential and commercial areas (GAD Municipal Puerto Lopez, 2015), which means a serious waste of resources and money for the public electricity company. Additionally, the public wired internet does not exist in Puerto Lopez; private companies that offer this service in medium-sized and large cities do not want to invest in towns because of the enormous costs of constructing a new infrastructure.

Due to the lack of these basic urban services in Puerto Lopez, tourism investors should build hotels and lodges with a total independence of the public basic services. Usually, they count on their electric plant, water cistern, new septic tank and parabolic antenna for the internet. It means a significant increase in the construction, operational and maintenance costs of private tourist infrastructure. These costs contribute to the rise in the prices of lodging, food and other tourism services. Even if this problem is repeated in several coastal tourist towns localised along the Spondylus Route, tourism has been growing and expanding continuously. Tourism investors have experienced substantial economic profits and are expecting a tremendous growth thanks to the international marketing promoted by the national government (Pozo, et al., 2014).

On the one hand, for the majority of them, these serious deficiencies are part of the folklore, identity and rusticity of the rural landscape in which Puerto Lopez is settled. Poverty and natural landscapes are a great combination and contrast at the same time, which allows showing to American and European tourists the reality of the rural Latin America. It is the magic of the underdevelopment and the possibility to live and touch it (Pozo, Ramírez, Saltos, & Vargas, 2014). On the other hand, for some tourists, it is an unexpected surprise to discover that the reality of Puerto Lopez and the Ecuadorian coastal region is not the one that had been sold to them virtually by internet pictures of amazing beaches and natural landscapes. This first shock and the poor quality of tourism services, regarding cost and efficiency, are reflected by their opinions on international tourism web pages like *Trip Advisor*, *Lonely Planet* or *Booking.com*.

The best example to show these disparities between the information that is provided by the internet and the reality are the following pictures which correspond to the same place and year (2012). The first photo was found on the internet and was taken from the beach. It is used to promote the natural and traditional landscape of Puerto Lopez (Figure 41). The second one was taken from the same point, but turning the camera 180 degrees (Figure 42).

Figure 41: Picture promoted by the internet (Photo: GAD Puerto Lopez, 2014[24])

Figure 42: The real Puerto Lopez (Photo: Pozo, 2012)

Normally, the reality about the quality of the built space in Puerto Lopez is not shown in the international media. Tour operators and travel agencies usually avoid including visual information about the town, the streets, and local culture. In Puerto Lopez and several coastal towns in Ecuador, the current urban image is not a tourist product to be promoted internationally and openly on the web.

[24] Source: http://www.puertolopez.gob.ec/

5.2.4. Vulnerability to natural disasters, economic crisis, and political instability

Despite the globally promoted capacity of resilience of the international tourism market, the tourism business in the Spondylus region has been extremely sensible to local and international economic crises, natural and man-made disasters, and political instability. Particularly, this historically poor coastal rural region has suffered from the incidence of various external threats during the last two decades, which contributed to intensifying social inequality and vulnerability.

The 1982-1983 and 1997-1998 ENSO[25] or *El Niño* phenomena were the most destructive and strongest ever measured along the Ecuadorian coastal region. They produced 1,051 and 2,882 million US$, respectively, of economic losses in transport and basic infrastructure, private property, agriculture, aquaculture, fishing and tourism. Intensive and torrential rains provoked floods and landslides with destructive consequences for low income families living on exposure (Arriaga, 2000). In coastal tourist towns like Puerto Lopez, the number of families living on high levels of physical vulnerability is massive. The rise of informal housing, the deficient construction quality of houses and the increment of natural disasters due to climate change, present a dark scenario for local communities.

The impact of natural disasters on the public expenditure is exponential. The arrival of the rainy season to the coastal region results in high costs before, during and after its impact. The provision of services and the construction of infrastructure to prevent, to mitigate, to assistance and to reconstruct demand an extended timer span that could extend over the entire year and could require millions of dollars of resources. This fragility and unsustainability of the local economic systems undermine any possibility to achieve social development. Economic crises have also been a direct enemy of the local tourist development. The volatility of foreign direct investments (FDI) in private tourist infrastructure usually abandons the area in cases of economic crisis, thus producing a context of general social vulnerability. The risk of consolidating tourism as an economic monoculture together with that combination of dependency and vulnerability are to create extremely dark scenarios in cases of international or national economic crises.

Finally, political instability is a significant restriction of local development. Ecuador experienced three overthrows of elected Presidents in 1997, 2000 and 2005, as well as three *coups d'états*[26] attempts in 1986, 1987 and 2010. These periods of extreme social discontent and insecurity caused the decrease and delocalization of foreign investments. Likewise, high levels of social disputes and economic crises fuel insecurity in cities and settlements and are thus

[25] El Niño Southern Oscillation Phenomena (ENSO).

[26] "The sudden overthrow of a government by a usually small group of persons in or previously in positions of authority". Source: http://www.thefreedictionary.com/coup+d'etat

strong disincentives of the domestic tourism. During the 1999 Ecuadorian dollarization economic crisis and the global economic crisis of 2008, several international hotels and lodges were closed due to the slump of domestic and international tourist arrivals (Mestanza, 2015).

Recently, at the end of 2015 and the beginning of 2016, the oil price fall revealed the extreme vulnerability to the economic crisis and oil dependency of both the state and local governments of Ecuador. Since mid-2014 oil prices have fallen by 75% "due to an oversupply and sluggish demand" (BBC, 2016). For first world economies and non-producers, this meant low prices of commodities and fossil fuels (BBC, 2016). However, for oil-producing-countries of the developing countries like Ecuador, it signified a severe economic problem.

Several local governments and public institutions in Ecuador could not comply with the payments for suppliers and employees, due to the cut of the monthly transfers from the national government. Likewise, the private sector was also directly affected. Providers of goods and services, external employees, and contractors were not able to get paid. The reasons were simple: The fall of the international oil price decreased the incomes to fulfil the national budget, and the majority of the municipalities in Ecuador do not produce their economic resources (Oyervide Tello, 2012). It is an oil dependency chain that ties all the national and private scales together and increases their interdependence and vulnerability instead of autonomy and resilience.

The Spondylus region is already suffering from first consequences of two external threats: The Ecuadorian economic downturn caused by falling oil prices and the imminent arrival of *El Niño* to the coastal region. After six years of constant increasing of private investment in tourism along the Spondylus Route, since 2015 and more intensively in 2016, tourist towns happened to see a progressive decrease in visitors and foreign investment. Many projects to construct, to remodel, or to expand hotels have come to paralyzation due to the lack of economic resources and foreign investment (El Universo, 2016) (Figure 43).

In traditionally crowded beach resorts like Montañita, big and small business owners report a decrease of 40% of their regular incomes during the first months of 2016. According to the president of the Association of Tourist Actors of Montañita, for the last five years, there were 250 business owners who invested 20 million US$ in private tourist infrastructure. Around 100 new hotels and hostels have been built since 2009. For this year, the majority of business owners planned to stop their investments or to allocate them in other places (El Universo, 2016).

Figure 43: Construction paralysed in Montañita (Photo: El Universo, 2016[27])

Despite the fact that El Niño has not yet unfolded its total destructive force on the Spondylus region, the number of international bookings (by the Internet) in local hotels seems to be less at the beginning of 2016 than in the last summer seasons. For many hotel owners, the main reason is the negative international advertising promoted about the El Niño effects along the Ecuadorian and Latin American coastlines. International tourists avoid visiting the Spondylus region due to the prognosis of natural disasters for 2016 (El Universo, 2016).

In addition to this decrease in visitors, hotel and restaurant owners claim strongly against the unfair competition from the local informal market. Traditionally, street vendors have been part of the public image in small towns and cities of Ecuador. They do not pay taxes, sell cheaper services or products, and are allowed to work in public spaces and along the beach without any restriction (El Universo, 2016). Although domestic tourists tend to consume more from the informal market due to their accessibility and lower prices, these economic activities have not been a serious competitor for the formal tourist market in the years before. Nevertheless, due to the current decrease of the international tourism, the official market is demanding for a fair competition to catch the less domestic tourism that still arrives on holidays.

[27] Source: http://www.eluniverso.com/noticias/2016/02/09/nota/5394913/baja-ritmo-inversion-zonas-ruta-sol

5.2.5. The predominance of an informal and low-qualified job market

As it has been mentioned above, informality has played a major role in the economic networks of the SSRR. The job market in urban and rural areas of Ecuador has been predominantly informal. Despite the implementation of deep reforms in the labour laws during the last years, the quality of the job market has not experienced any consistent improvement in rural areas (Wong, 2013). In five of the seven cantons which shape the SSRR, the percentage of the population working formally had a moderate increase between 2% and 5% from 2000 to 2010. Only Salinas and La Libertad decreased their quantity of formal workers over the last 10 years (Figure 44 and Figure 45).

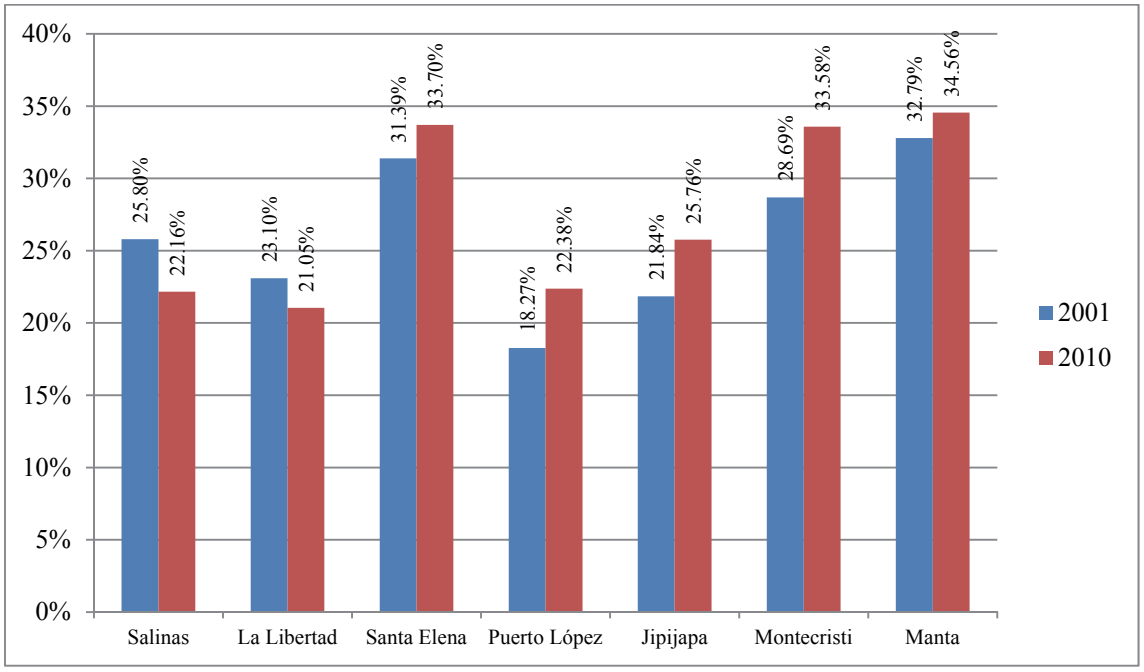


Figure 44: Percentage of SSRR population working formally 2001-2010 (Source: SNI, 2014)

Puerto Lopez, in particular, had the lowest amounts of formal workers, despite the arrival of domestic and international tourism and the rise of private and public investment in tourist infrastructure. A predominant informality has been dominating the SSRR and the Puerto Lopez labour market for the last two decades. The percentage of formal workers by economic activities in the SSRR is relevant information that allows understanding the economic geography of this region and the role of every canton in it. Puerto Lopez, Santa Elena, Salinas, and Jipijapa have agriculture, aquaculture, fishing and retailing as their main economic activities. In contrast, in Montecristi and Manta, the manufacturing industry has a leading role. Although tourism does not appear in Ecuadorian statistics, there are many economic activities that are directly or indirectly related to it.

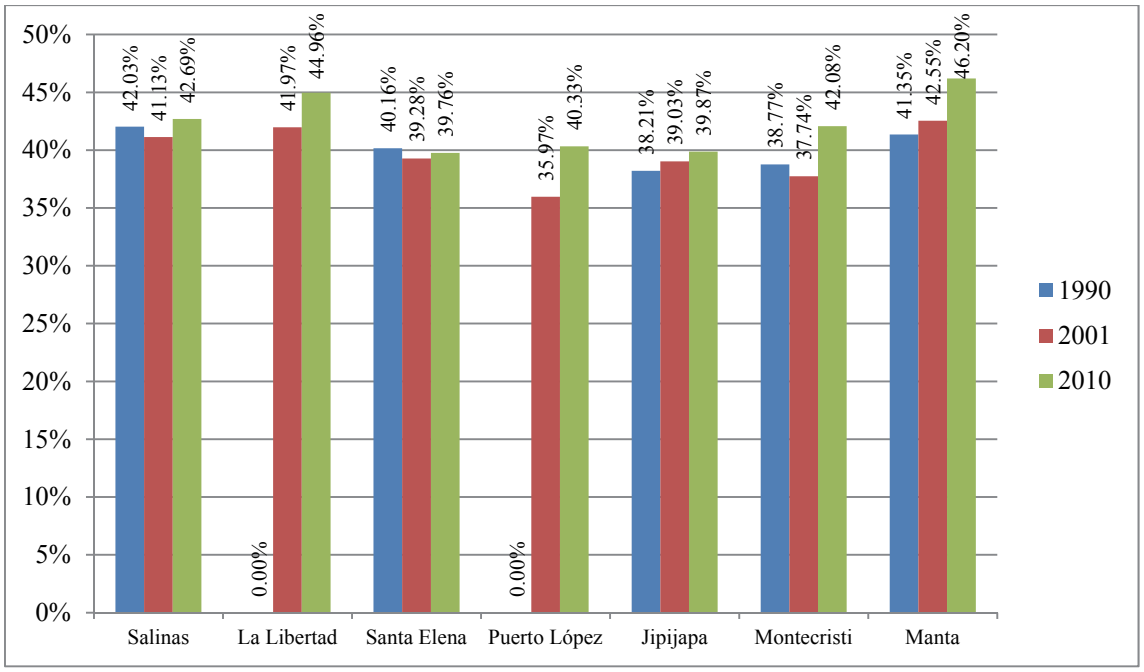


Figure 45: Percentage of SSRR population working formally and informally (Source: SNI, 2014)

By looking closer at the percentages of the main economic activities in the Puerto Lopez Canton, some specific facts are identified. There still is a predominance of agriculture, forestry and fishing (37.61%), enlarged by wholesale and retailing (14.61%) as main economic activities, which in a first view represents a rural context. Nonetheless, in the last 20 years, some new economic activities related to tourism have emerged and are becoming stronger.

Economic activities associated directly and indirectly with tourism like construction (5.40%), industrial manufacturer (6.36%), lodging and food services (5.37%), transportation (4.76%), and other types of services (1.56%), do not require workers with high levels of technical qualifications, formal studies or experience. Additionally, the enormous level of informality on the labour market allows the participation of almost all the local actors as well as an easy exchange of and the combination of other economic activities.

From this point of view, informality could be understood as a "God blessing" in rural areas. Families have the possibility to divide their work and to access more financial income sources. For example, a fisher or farmer can dedicate one-half of a week to fishing or farming and the other on to tourism retailing. His wife can have a small informal restaurant or kiosk at home or directly on the public sidewalk. Likewise, young children sell handmade earrings, rings, necklaces, or souvenirs to visitors along the beach and the main commercial streets. Despite a sporadic police control, usually, there are no limitations or laws against informal and ambulant retailing along beaches and streets in Ecuador.

5.3. New tourism landscapes in the SSRR: the dichotomy of development and informality

Over the past decade, the construction of private and public tourist infrastructure grew exponentially in the SSRR (MINTUR, 2007). New tourist resorts, hotels, guesthouses, restaurants and others complementary services have been deployed along the coastline and inside the still pristine tropical moist forest. Additionally, local governments focused their urban and regional planning visions on the development of tourism by the construction and improvement of urban infrastructure.

At the same time, there was a third response to the arrival of tourism as relatively new and profitable economic activity. Local actors and natives, who were traditionally dedicated to fishing or agriculture, reacted and proposed their own and particular tourist infrastructure thanks to the predominance of informality in the context of economic activities and municipal regulations (Figure 46).

Figure 46: Hotels and *hostales* in Puerto Lopez (Photos: Pozo, 2015; Pozo, 2012)

Nowadays, these three socio-spatial reactions are sharing time and space and are shaping the complexity of what is defined by the author as a new tourism landscape. The new human-environment relationship is different in comparison with the pre-Hispanic and even the post-Colonial periods (Harris et al., 2004). The contemporary subsistence patterns changed for the last two decades due to the internationalisation of tourism along the coastal region. The capacity of shaping the landscape that has characterised human activity since centuries has also been driven by other factors like climate and soil type (French, 2010). With a 21st century threatened by climate change effects and the spreading of globalisation in remote regions like the SSRR, these new landscapes will stamp deeper footprints than ever (Möllers, et al., 2015). The main questions are: How sustainable and resilient are these new landscapes? What are the implications of these parallel types of development on the resilience of local communities and ecosystems?

5.3.1. The 21st century ecotourism boom, oil dependency, and green populism

Due to the actual massive advertising in local media, it results hard to believe that tourism is not a relatively new economic activity in the central coast of Ecuador. Since the first international tourism promotion of specific tourist sites in 1950 and the official creation of the first Tourism Ministry in 1992, the national promotion and investment on attracting tourists to diverse geographical sites of the country have been rising constantly (Prieto, 2011).

Nevertheless, the reality of the Ecuadorian tourist offer in relation to the international demand of the tourism markets is not equilibrated. Despite the efforts of the national government and private investors deployed for the last decades, there is a clear deficit in terms of infrastructure, quality of the services, security, and quality of the built environment, but principally, of research and long-term studies (Prieto, 2011). For the Ecuadorian tourism planning, the first decade of the 21st century was a period of transforming the old public management structures inside the government and in the private sector by the observing and adapting successful (and unsuccessful too) experiences in the developing world. The examples of the Central American and Caribbean tourist countries like Costa Rica, Jamaica or Dominican Republic, which have invested high percentages of their public budgets in the international promotion of their natural resources and biodiversity as a tourist brand image, had relevant influences on the process of modernization and globalisation of the Ecuadorian tourism planning and marketing in the last decade. Despite of the social shakes produced by two economic crises (2000 and 2008), a disastrous concentration of political instability (governmental corruption, overthrow of two presidents) and two notable falls of the oil prices, all the national administrations during the period 2000-2015 have endured the vision of tourism as a strategic source of income and social development.

One of the first steps was the decentralisation of the tourism management and planning over the territories in 2000 (MINTUR, 2007). Local governments received the legal competencies that allowed them to decide and plan their tourism development. First, the largest and most urbanised cities (Quito, Guayaquil, and Cuenca) began to invest economic resources in the improvement and reconstruction of their urban infrastructure in order to achieve a position in the competitive global network of tourist flows. The creation and reinforcement of their urban images based on the promotion of urban icons and local culture were the main strategies. Quito and Cuenca promoted their colonial downtown, while Guayaquil searched a new urban image based on its historically close relation with the river and nature. This was the beginning of the *Regeneración Urbana* or urban regeneration master plan, which has strongly been fostered by the Municipality of Guayaquil and the local elites since 2000.

In the second half of the 20th century, Guayaquil experienced an intensive rural-urban migration. The lack of economic resources, the popularisation of governmental corruption and the boom of informal low income settlements fuelled the progressive deterioration of the urban infrastructure. In the 1980s and 1990s, the main port and largest city of Ecuador suffered from a critical situation of his physical and functional urban space. The urban regeneration program was a response to this situation and the search for a new urban image that was to increase the local identity and allowed to promote the city globally. In 2000 the Municipality contracted the University of Oxford to develop a study and propose a new language for the urban design (Figure 47 and Figure 48).

Figure 47: *Malecón 2000*[28] project (Source: Municipality of Guayaquil, 2000[29])

Despite the diverse positive and negative criticism to this program meet, it is a fact that the urban regeneration has had a strong influence on the design and construction of urban infrastructure in the Ecuadorian settlement system. Especially, it provoked a favourable acceptance by both the local governments and inhabitants in rural areas. The first began to invest public resources in similar urban projects, which were adapted to the economic reality

[28] In Ecuador the Spanish word '*malecón*' means public seaside park. In the colonial extractive settlements systems, the *malecón* was a public space localized along the river with the main function of loading up and down the agricultural products (cacao, bananas and coffee) from the *canoas* or small river boats that arrive from other towns and cities. In the 20th century the function as downtown recreational park was included. The Malecón 2000 is the emblematic urban project of the urban regeneration program promoted by the Guayaquil local government at the end of the 1990s. It is a riverside public park of 2.5 km length that deploys along the Guayas river coast line.

[29] Source: http://latinoamericaportierra.blogspot.de/

and scale of small towns. The latter accepted these changes as a form of modernization or evolution from a traditionally stigmatised rural context to a modern urban image. The term *pueblo* or town meant antiquated, uneducated, and poor. Urban regeneration was promoted and locally understood as the arrival of modernity and development.

Figure 48: *Malecón 2000* today (Photo: www.guayaquilesmidestino.com[30])

In addition, tourism began to boom along the central coastline. In 2000 the first PMCI or *Plan for the integral coastal management* (Arriaga, 2000) identified the increase of the domestic and international tourism along the coastal region as a vital force of transformation which should be considered in the planning of its social and economic development. Tourism activities were progressively spreading over the area from the northern cruise ships port city of Manta and from the southern beach resort of Salinas. The amazing natural landscapes, abundant ecological biodiversity and the rustic life in fishing villages attracted tourists. Nevertheless, this document recognised the extreme poverty, social vulnerability towards natural disasters and the deficiency of basic infrastructure as undeniable restrictions to achieve its sustainable development (Arriaga, 2000).

In 2003, a national survey about domestic tourism confirmed that the most preferred tourist destinies were the natural sites (29.50%) and the beaches (29.10%), summing up to a total demand of 58.60% of the domestic tourism (MINTUR, 2007). National holidays and school vacations are the most expected dates during the year by tourist destinations along the Ecuadorian coastline. Before every holiday, coastal towns prepare to receive thousands of

[30] Source: http://www.guayaquilesmidestino.com/es/malecones/malecones-urbanos/malecon-simon-bolivar

domestic tourists for one weekend. Puerto Lopez receives approximately 50,000 tourists per year (MINTUR, 2007, p. 41).

Subsequently, in 2007 the new tourism master plan (PLANDETUR 2020), which established the guidelines to consolidate tourism as one of the most important sources of sustainable economic resource in 2020, included the SSRR as a strategic tourist corridor to be developed. Based on this fact both public and private interest in this region jumped. From 2007 to 2015 national and local governments focused their public investments in urban tourist infrastructure.

Using a big and inflated public budget based mainly on oil exportation, the *progressive* socialist national government of Rafael Correa included the E-15 or Spondylus route in an aggressive program of construction of transportation infrastructure and tourism development. From 2008 to 2010, the Spondylus Route was totally reconstructed and extended to the northern coast. Another consequence was the creation of a new national law of tourism in 2012 (*Ley Orgánica de Turismo*) and the designation of Puerto Lopez as a Tourist Protected Area (TPA) or *Área turística protegida* (ATP). The transformation of this region was accelerated by the construction of new tourist infrastructure, which urban design was mainly based on the Guayaquilean urban regeneration.

5.3.2. The importation of a new urban image for tourist coastal towns

The new adapted urban tourist infrastructure emerged in a rural context where informality, weak economic resources, "drop by drop" strategies of construction and public corruption had been shaping the urban landscape. Seaside parks and pedestrian ways (*malecón*), recreational squares, colouring cobblestoned streets, exotic imported plants and palms, fountains, glass-metal-façades, curved metallic roofs, and other products of the local creativity were the new icons of an urban architectural and urban language. Nevertheless, nowadays this phenomenon produces several interpretations. For foreign tourists, it is part of the local folklore, while for local governments is the arrival of an urban modernization era. For old natives, it could be just an unfortunate transformation of their town and home (Figure 49).

Figure 49: *Regeneración in* Montañita (Photo: latinoamericaportierra.blogspot.de, 2015[31])

The case of Puerto Lopez is a clear example of this process of transformation. The coastline along the beach had been totally abandoned for several years totally abandoned. Any national or local government invested money on its redesign and reconstruction. With the new ATP program, the national government will finance the construction of a new malecón (breakwater or coastline park), with an estimated costs of 8.5 million US$ (MIDUVI, 2014).

[31]Source: http://latinoamericaportierra.blogspot.de/2011/05/ecuador-guayaquil-montanitas-puerto.html

5.3.3. The standardised private tourist infrastructure

Since the beginning of the aggressive program of tourism branding promoted by the Ecuadorian national government in 2007, the private investment in tourist infrastructure along the Spondylus Route has simply skyrocketed. Local elites from Quito and Guayaquil, in association with foreign investors or separately, found the opportunity to reproduce their capital on this resilient and profitable market. New tourist entrepreneurships were constructed inside and on the peripheries of the most visited coastal cities and towns.

Next to the amazing natural landscapes and the rural ways of life in fishing villages, the relative flexibility of local governments (low taxes and efficient basic infrastructure) and the low land prices were other incentives to attract the flows of foreign investors. The demand for urban and rural land increased but within a context of informality and corruption. Land disputes between natives and new owners on the scene became a common situation along the Spondylus Route. Social and political powers were final arguments in every dispute in this vibrant economic region where the planning vision of tourism as the cornerstone of development always superimposed the interests of natives. The ecotourism boom shaped the new private tourist infrastructure, and many of the standardised Caribbean-exported models of hotels, beach resorts, familiar hotels, rustic bungalows, camping sites and green lodges were erected. These facilities were mainly oriented to foreign tourists, who have the strongest purchasing power and the highest request for quality. According to official tourist statistics, there are approximately 12,000 formal accommodation places in Salinas, Libertad, and Santa Elena (Mestanza, 2015). Overall, in 2015 there are 481 tourist accommodation establishments officially registered in the Spondylus region and classified into five types according to a local standard defined by the Ministry of Tourism (MINTUR, 2016) (Table 16).

Canton	Luxury	1st class	2nd class	3rd class	4th class	Total	Percentage
Salinas	3	18	44	32	2	99	20.59%
La Libertad	-	3	10	22	-	35	7.28%
Santa Elena	-	10	36	70	-	116	24.12%
Puerto Lopez	-	10	27	49	-	86	17.88%
Jipijapa	-	1	10	18	-	29	6.03%
Montecristi	-	1	5	5	-	11	2.29%
Manta	1	26	37	39	2	105	21.83%
Southern Spondylus	4	69	169	235	4	481	100%
Quito	9	89	182	308	3	591	
Guayaquil	13	33	87	131	10	274	

Table 16: Registered accommodation establishments in SSRR (Source: MINTUR, 2016)

Every year the SSRR prepares for receiving domestic and international tourists, who travel from different cities to the coastline looking for warm weather, beaches and seafood. Despite the fact that the Spondylus Route has a regular average of visits during the year, the most expected dates of the year are the summer national holidays of Carnival (14-16 February) and Good Friday or

Viernes Santo (3-5 April). During the four days of the Carnival 2014 holiday, around 500,000 tourists visited the Santa Elena Peninsula (Salinas, Libertad, and Santa Elena). This massive flow of domestic tourists produced economic profits that reached a peak of 57 million US$ (El Comercio, 2014). Additionally, there are other national holidays which are used by domestic tourists to visit the coastline, as New Year (31 December - 2 January, Christmas (24 - 25 December) and Labour Day (1st May). Nevertheless, Carnival and Good Friday are traditionally the most famous peaks regarding beach tourism.

These intensive temporal flows of tourists generate a cyclical dynamic of construction-destruction-reconstruction of private tourist infrastructure. Like a huge staging or scenography, all the coastal towns along the Spondylus Route prepare several months before for the visit of tourists. A process of construction, destruction and remodelling of private tourist infrastructure takes place every year with more intensity and speed. Hotels, lodges, restaurants, places of familiar entertainment, nightclubs, pubs and other types of complementary tourism services improve their physical, functional and esthetical features to compete in attracting more visitors. These dynamics, before and after holidays, fuel the local and regional economic networks, particularly in the informal sector. One direct beneficiary of this cycle of capital reproduction and accumulation is the structured and unstructured construction, which does not need qualified workers and is required all the year around. On the other hand, Guayaquil and Quito housing markets did not want to be left behind and began to plan and construct second-home residential projects in association with foreign capital or financed by governmental oil-profits loans for private medium and large entrepreneurship. The demand for security and basic opulence in residential projects of the social unequal cities was copied and pasted on this tourist rural-urban context. New gated communities were erected on the best plots with direct access to the beach, independence of basic municipal services, with green areas, pools and a high standard of comfort and technology.

Obviously, there was also an offer of gated communities for middle income families that have financial access to state housing loans or retirement funds. In this case, the investor promotes and sells the majority of the project before construction. Some projects just sell the plot inside the gated community, and the future owners have the opportunity to build their houses during extended periods of time. Another option is the following housing projects, which offer two or three basic models of houses depending on the number of family members and their requirements. Finally, there is a relatively new type of residential project which has been promoted by the internet in the United States and Europe. It is the residential community of foreign retirees.

5.3.4. The informal response of the social vulnerability

At the same time, the booming tourism market along the Spondylus Route provoked the informal response of inhabitants and regional immigrants. After hotels, lodges, and urban regeneration projects having invaded the towns and their peripheries, natives realised that their plots and houses became high-value assets on their hands. Some sold their plots to foreign or local investors, but there were also others who decided to continue working on fishing or agriculture in order to invest their profits on transforming their houses into small informal lodges, guesthouses, restaurants or retailing shops. Other families parcelled up their plots and distributed them among members so that everyone could decide the best way to choose. This parcelling process took place on small, medium and large plots localised on the downtown and urban peripheries as well as in rural areas (Figure 50).

Figure 50: Houses in the downtown of Puerto Lopez (Photo: Pozo, 2015)

Additionally, the flows of regional rural migrants attracted by new job opportunities created the demand for basic and cheap housing, which triggered the emerging of informal housing that occupied the land that nobody needs or wants (flood plains, river borders, and risky slopes). The outcome has been the increase of social vulnerability and exposure to natural and human-made disasters like floods, landslides and forest fires. The deficient physical quality of the structure and materials of the self-constructed houses (wood, bamboo, and zinc), increase these risks exponentially. Particularly, houses constructed with columns and beams made of wood, and walls made of clay or cement bricks, represent a high level of exposure due to the combination of materials that have not the same elastic reaction in case of been affected by an earthquake. This type of construction practice could be appreciated on the left side of the following figure (Figure 51).

Figure 51: Informal self-construction in Puerto Lopez (Photo: Pozo, 2015)

The response of the national and local governments to informal housing was the construction of low income formal housing projects at the peripheries. However, the change from informality to formality is not easy for low income migrant families, because it is connected to new payment responsibilities like piped water, electricity, security, and municipal taxes. On a fluctuant permissive job market, where informal labour is not controlled and working places are not guaranteed, formal housing could be more a problem than support.

In Ecuador, social housing has been mainly promoted and constructed by the national government. The *Ministry of Urban Development and Housing* or *Ministerio de Desarrollo Urbano y Vivienda* (MIDUVI) has been the public institution responsible for the implementation of social housing program and projects in urban and rural areas. Particularly, in the coastal region and in rural areas, housing projects have been predominately developed as *lotizaciones* or groups of single family homes (one family per house), which means low density housing.

The architectural design of the majority of housing programs has not experienced deep changes for the last decades. Basically, the basic unit is a one floor brick-wall house of 36 square meters constructed on a 96 square meters plot. Due to the high costs of construction materials in Ecuador, and especially in rural areas, houses are provided to families with basic ornaments and modest interior finish (Figure 52).

Figure 52: Social housing project in Puerto Lopez (Photo: MIDUVI, 2012[32])

32 Source: http://www.habitatyvivienda.gob.ec/198-millones-invirtio-el-miduvi-en-manabi-desde-el-inicio-de-la-revolucion-ciudadana/

Section C: Research study and results

6. Socio-spatial transformations in Puerto Lopez (1990-2010)

Whoever searches for information about Puerto Lopez, or indeed, whoever visits it for a couple of days, probably will have the first perception that it is a small fishing and tourist town localised in the middle of nature with amazing natural landscapes, poverty and traditional ways of life related to artisanal fishing. Nonetheless, there are thousands of years of history in the archaeological heritage that still remains under the ground of the contemporary settlement (Lunniss, 2014). Moreover, there are conflicts and challenges in the daily complex interplay between inhabitants and the natural landscape (Harris et al., 2004), particularly since the arrival of international tourism. Uncontrolled and rapid processes of social and spatial transformations have occurred for the last two decades without a clear local understanding of the causes and the adverse effects.

Since the arrival of the first tourist flows in the 1990s, new economic activities, new ways of life and new urban forms emerged. As it began to be promoted as a new ecotourism destination for domestic and international visitors, Puerto Lopez mutated into a small globalised tourist city or beach resort. The appreciation of urban land along the beach and along the main commercial streets triggered a process of physical and functional changes. Since the improvement of the regional transportation infrastructure in 2010 and the official designation of Puerto Lopez as the first ATP pilot project (Tourist Protected Area) in 2012, these transformations have been accelerated. The most relevant effects are the rapid and uncontrolled urban growth and the emergence of new urban forms related directly and indirectly to tourism.

The social change is graphically represented by maps based on statistical data of the national census 1990, 2001, and 2010. This data was mapped on the suburban scale of census sectors. Likewise, the spatial change is described by maps based on geographical information presented by orthophotos and imagery from different years to measure and characterise the speed and divergences of urban growth of Puerto Lopez.

Finally, the analysis of this growing process is summarised and represented in a scheme of urban growth, which tries to reflect the evolution of this rural coastal settlement to an urban globalised beach ecotourism resort. It is important to remark that this scheme is a graphic representation of the transformations in this specific case study. However, it aims to be a contribution to finding traces of similar transformations along the Spondylus Route and other tourist regions in the tropical developing world.

6.1. Puerto Lopez: from a fishing town into a tourist destination

6.1.1. Puerto Lopez, the canton and the city

Puerto Lopez is the official name of the canton and its capital city. The Puerto Lopez canton is located in the central coastal region at the southern border of the Manabí Province. In 2010, this canton had 20,451 inhabitants and 420 square kilometres (Figure 53). For the last decade, it has been promoted by the government as a national and international ecotourism destination because around 80% of its territorial surface is occupied by a natural reserve, the Machalilla National Park (IEE, 2012; MINTUR, 2007).

Figure 53: Geographical location of Puerto Lopez (canton and city) (Source: Own draft, 2014)

The city of Puerto Lopez is the capital of the canton and the most important fishing and urban tourist centre in the settlement system. It is the home of 10,928 inhabitants who live within its 3.84 square kilometres of the urban area (INEC, 2010) (Figure 54).

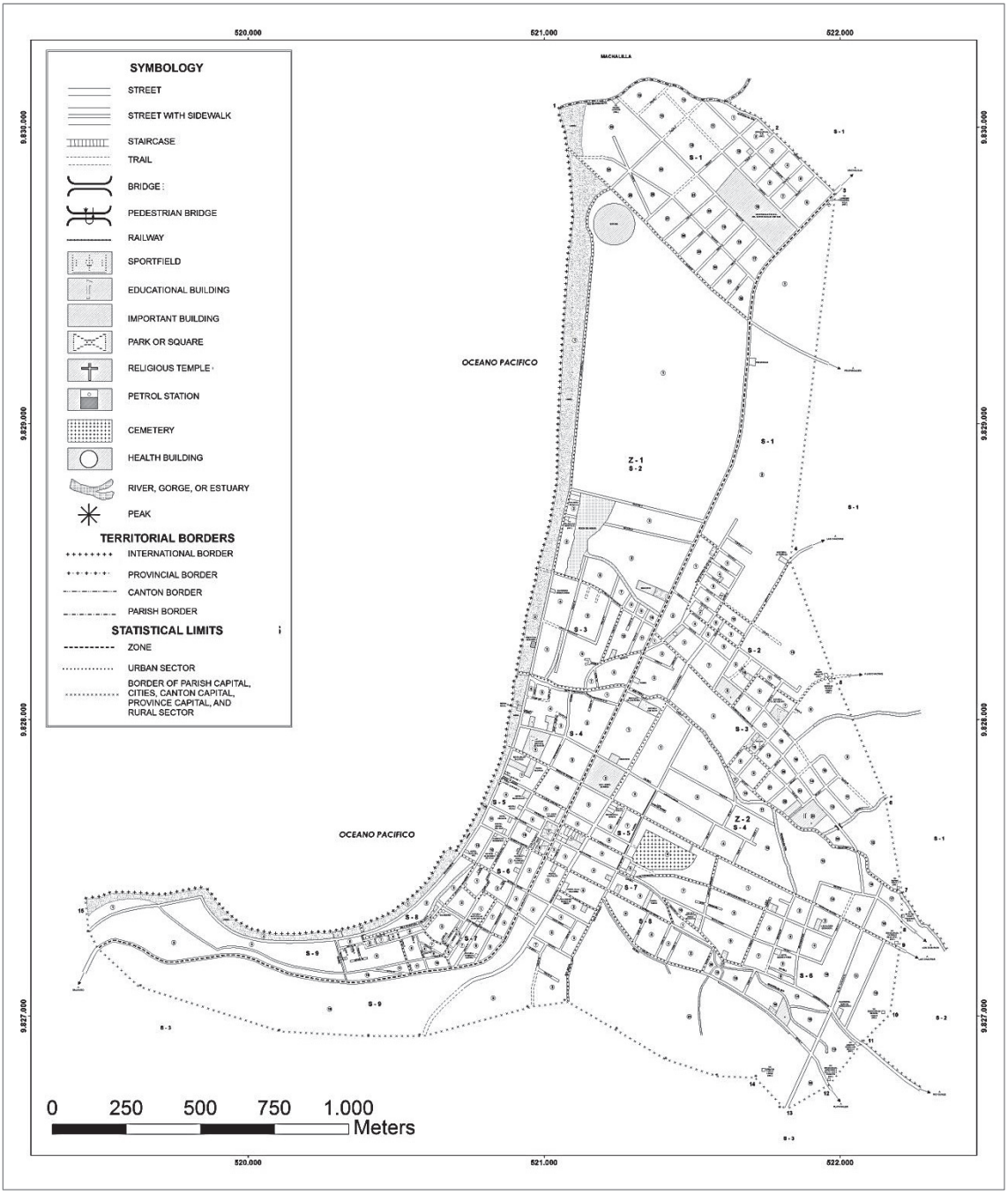


Figure 54: The fishing and tourist town of Puerto Lopez (Source: INEC, 2010)

Its geographical location and still preserved natural landscape contributed to the development of primary economic activities like artisanal fishing and farming, as well as the rise of secondary and tertiary economic activities related to ecotourism. Puerto Lopez is settled at the shore of the calm waters of a small bay of the Pacific Ocean and at the mouth of two rain-season-rivers which connect the sea with the western Agua Blanca Valley.

It is surrounded by a hilly and green landscape, which characterises the tropical coastal moist forest. In the north and north-east is bordered by the Machalilla National Park. The Spondylus Route crosses through the middle of the town from south to north, and it is also a physical division between the old flat western downtown and the new hilly eastern neighbourhoods. This road is the only transport connection with the central coast settlements system and the cities of Manta, Salinas and Guayaquil.

6.2. History and evolution of the built space 1000 BC – AD 2010

6.2.1. From a fishing village into a tourist coastal town

The patterns of urban growth can be grouped into four main periods (Figure 55):

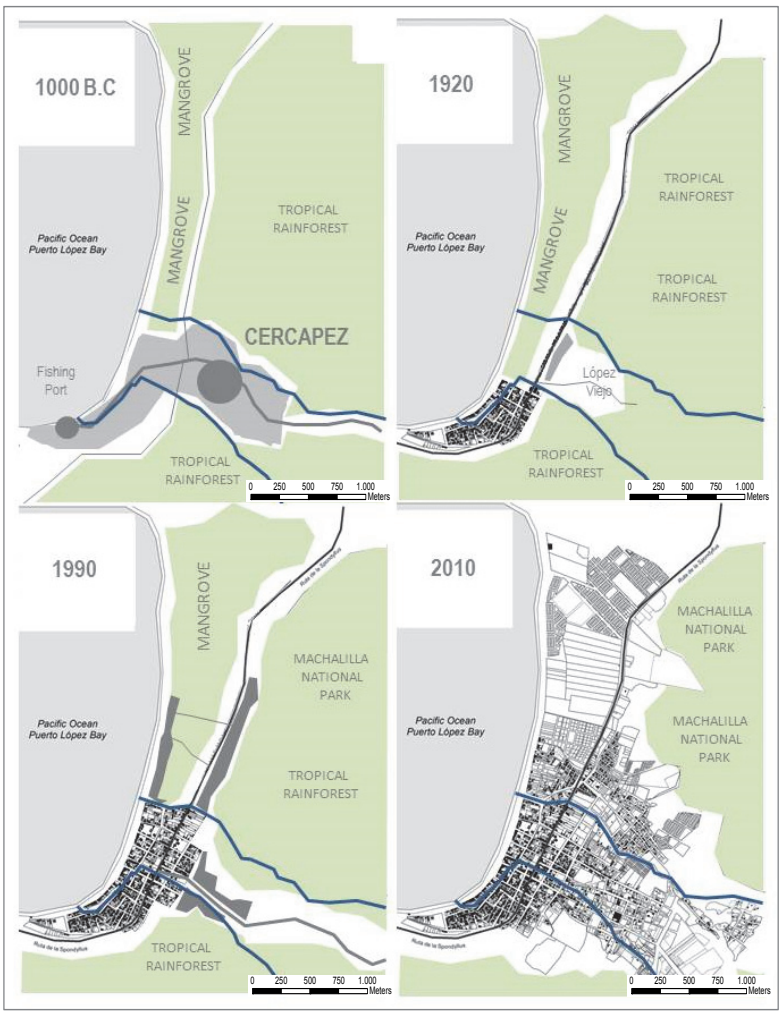


Figure 55: Patterns of urban growth, 1000 BC – AD 2010 (Source: Own draft, 2015)

- **Pre-Hispanic port city (1000 BC – AD 1532).** Cercapez was an important religious and commercial port city from the pre-Hispanic cultures of the *Manteña* and *Engoroy*.
- **Fishing village (1532–1923).** Fishing and agricultural production for local consumption. *La Ensenada* is a small fishing village during the colonial and part of the republican period.
- **Fishing town (1924 – 1994).** A local economy based on artisanal fishing. Puerto Lopez is a fishing town and Parish (*Parroquia*) from the Jipijapa canton.
- **Tourist destination (1995 – 2010).** Globalised ecotourism city and fishing port. Puerto Lopez is a tourist city and officially the capital of the Puerto Lopez canton.

6.2.2. The pre-Hispanic port city of *Cercapez* (1000 BC - AD 1532)

Despite the fact that Puerto Lopez is not a colonial-founded city and that it has been settled initially as a small fishing village at the end of the 19th century, it is localized on the site of the ancient pre-Hispanic city of Cercapez. This settlement was an important administrative, ceremonial and commercial urban centre of the *Manteña* and *Engoroy* cultures around three thousand years ago (Lunniss, 2014). In the last five decades, several archaeological excavations in Puerto Lopez, Machalilla, Salango and Agua Blanca have identified the location of pre-colonial cities and towns. Particularly, the discovery of the remains of ancient settlements and the mapping of specific urban patterns in the 1970s allowed to understand some special features of the ways of life, the economic activities and the hierarchical social order of these ancient pre-Hispanic civilisations (Lunniss, 2014) (Figure 56).

Figure 56: Graphic representation of the Manteña culture (Source: MCCM Manta, 2014[33])

Three thousand years ago, the site of the present Puerto Lopez had been an important commercial port and spiritual centre from the *Manteña* (AD 600 – 1532) and *Engoroy* (1800 BC – 300 BC) pre-Hispanic cultures. According to the historical chronicles laid down by the first Spanish explorers who arrived at the Ecuadorian central coast in the 1530s, the city of Cercapez was an important urban centre and commercial port of the Manteña culture well-structured settlements system. Its strategic geographical location over hilly land 1 kilometre

[33] Source: Mural of the MCCM (Museo Centro Cultural Manta), Manta, Ecuador.

inland and at the mouth of two small rivers that connect the internal agricultural valley with the sea, describes its function as an important centre of storing and commerce of agricultural and seafood. The discovery of other secondary agricultural settlements inside the Agua Blanca Valley and remains related to commercial sailing (stone anchors, fishing tools and gears) along the Puerto Lopez beach support this hypothesis (Lunniss, 2014) (Harris et al., 2004).

In 1979, several archaeological remains and more than 120 ancient stone foundations were discovered and mapped in Puerto Lopez by archaeologists from a scientific program (*Programa de Antropología para el Ecuador* – Anthropology for Ecuador Program). These rectangular stone foundations can still be found on the ground near the original cemetery at an approximate distance of 500 hundred meters to the west of downtown. Additionally, several fishing tools, cooking implements, ornamental and religious pieces, are spread along the southern section of the beach (Lunniss, 2014; Bohórquez, 2012; Harris et al., 2004) (Figure 57).

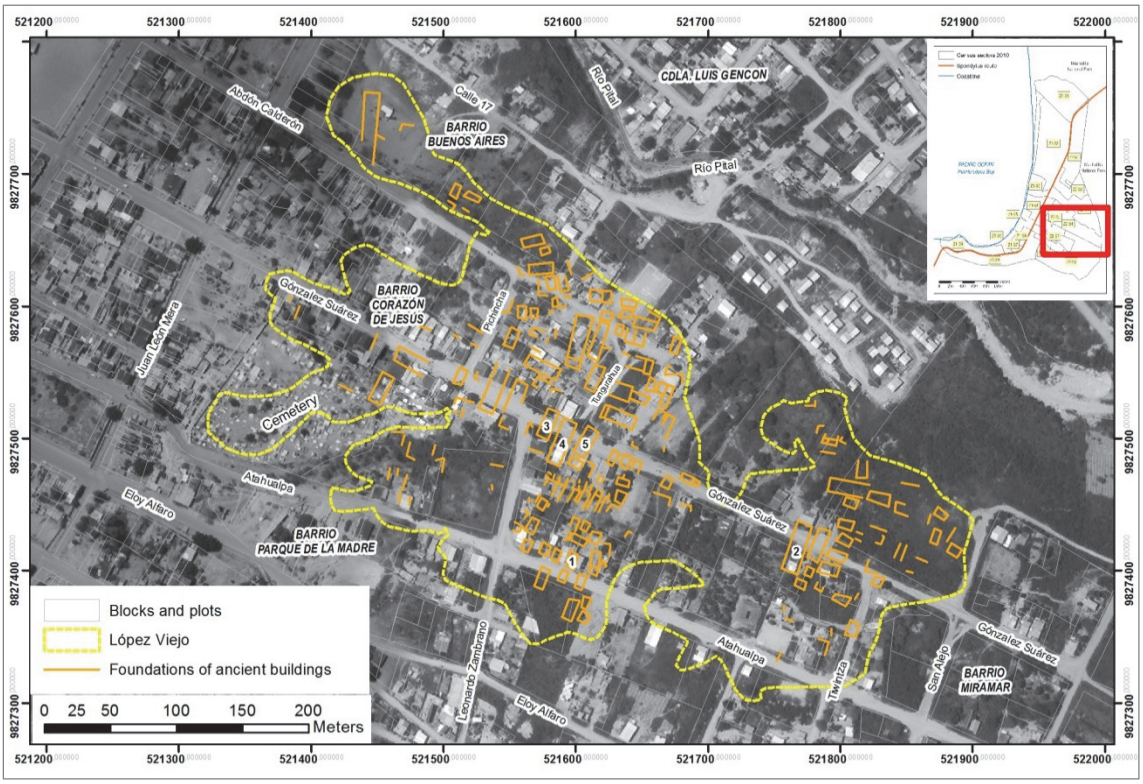


Figure 57: *Lopez Viejo* (Source: Own draft based on Dixon & Nelson, 1979)

6.2.3. The fishing village of *La Ensenada* (1532 - 1923)

For the colonial period in Ecuador (1532 -1809), once Cercapez had been abandoned by the pre-Hispanic natives, a small fishing village came into being in the southern part of the beach. Its Spanish name *La Ensenada* means "the inlet". It is a natural cove in the bay surrounded by a seawall formed of stones and reefs. Its calm waters and efficient accessibility from the beach were the perfect features for being used as a native port by the first fishing communities (Figure 58).

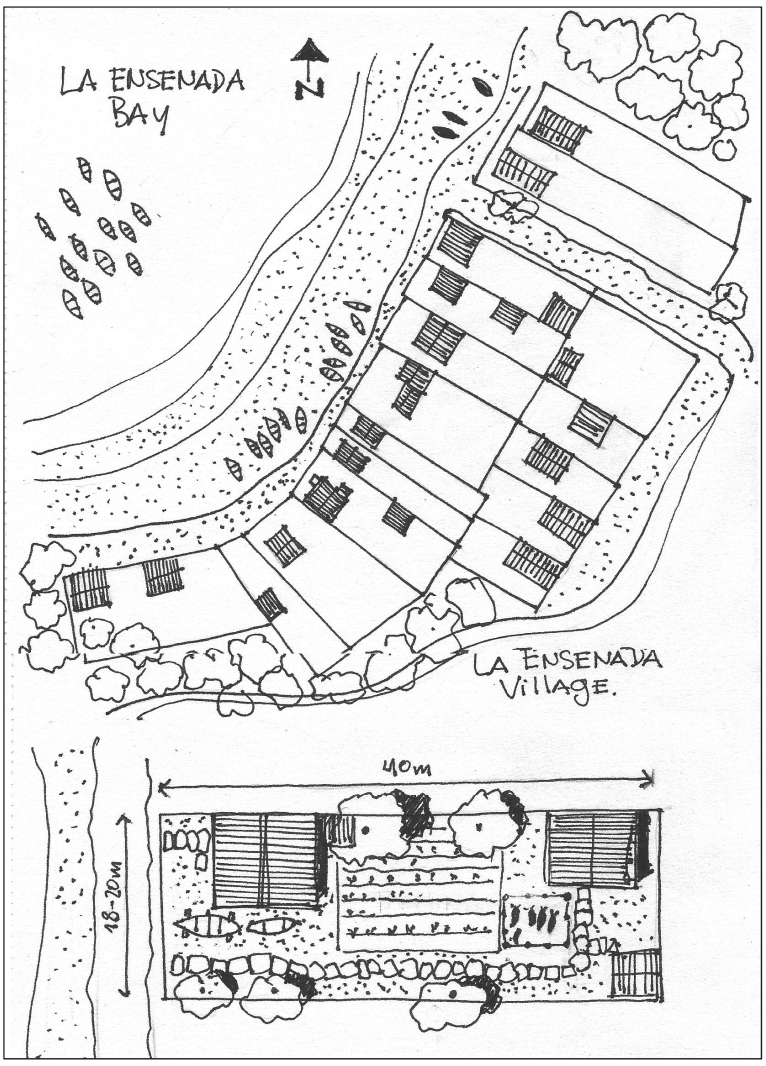


Figure 58: Graphic representation of La Ensenada fishing village (Source: Own draft, 2015)

The first inhabitants of La Ensenada were fishermen and farmers who produced mainly for local consumption. The accessibility to this village was tough for land transport, particularly during the rainy season. All the small villages localised along the central coast were connected among each other by muddy roads until the first half of the 20th century. The main transport system between coastal towns and villages was provided by small fishing boats.

Due to its condition as a rural settlement and the lack of a Property Register office, the plots were large, irregular and dispersed mainly along the beach. The houses were constructed using local construction materials (wood, bamboo and dry palm leaves) and over *palafittes* (stilt houses). Inside the plots, the families combined fishing and farm activities (Figure 59 and Figure 60).

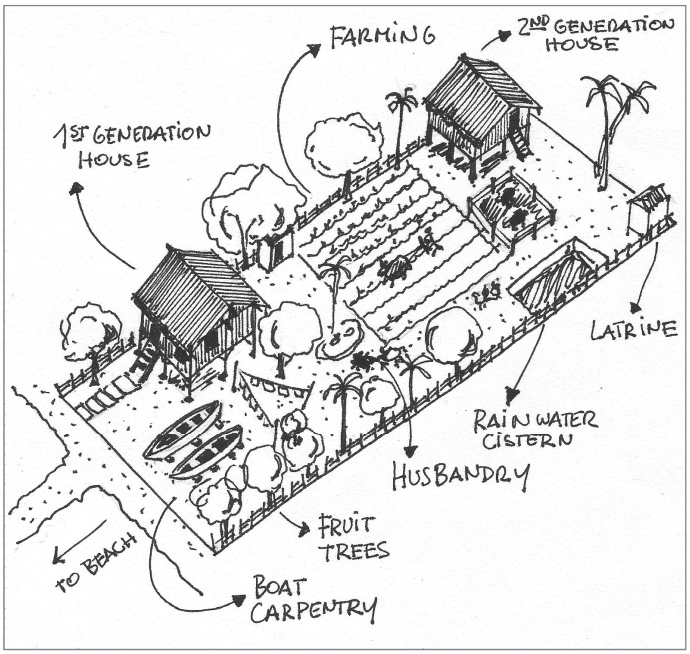


Figure 59: Agricultural and fisheries plot from La Ensenada (Source: Own draft, 2015)

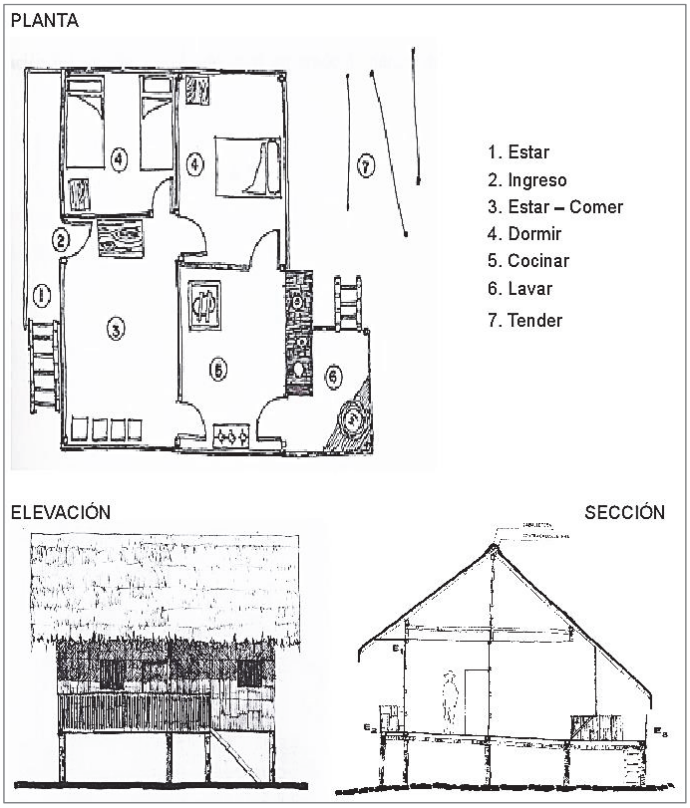


Figure 60: Rural house in Manabí province, Ecuador (Source: Sainz & Camino, 2014, p. 137)

The architecture and construction materials did not experience significant changes. The natural environment and the tropical weather influenced the new inhabitants to apply the same construction methods and materials as the pre-Hispanic cultures settled before. The use of local wood and bamboo as structural materials combined with stone wall foundations and wood piles *(palafitos)* was reproduced along the coastal region with minimal technical variations (Sainz & Camino, 2014) (Figure 61).

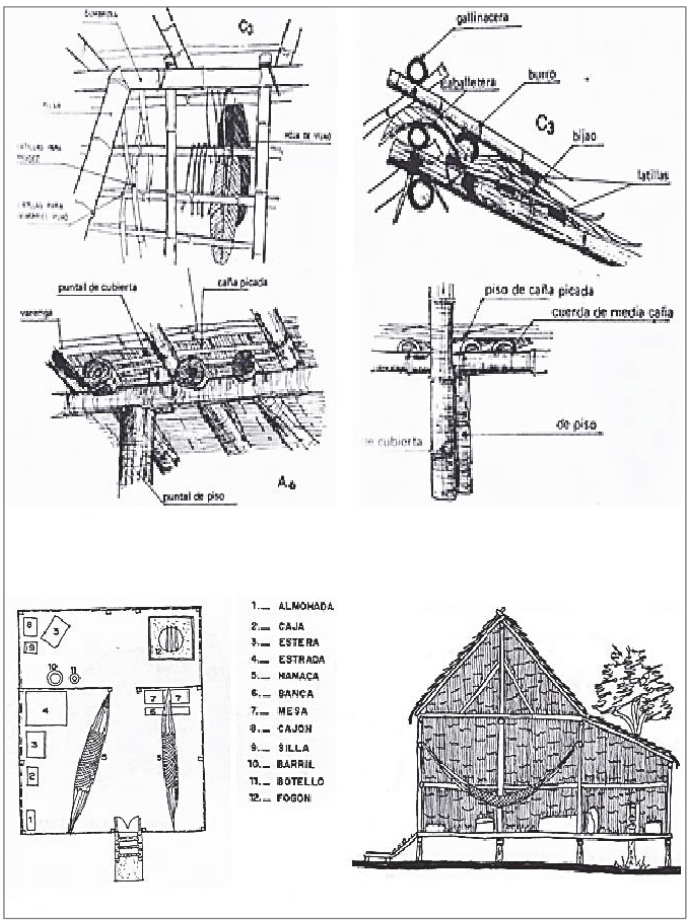


Figure 61: Traditional wood and bamboo house (Source: Sainz & Camino, 2014, p. 138)

6.2.4. The fishing town of Puerto Lopez (1924 - 1994)

In 1923, La Ensenada changed its name to *Daniel Lopez* or *Puerto Lopez* and was officially designated as a parish of the *Jipijapa* canton. This new designation meant its consideration as a small town with a substantial quantity of population and concentration of primary and secondary economic activities. Due to the abundance of the marine resources and the accessible conditions to develop the artisanal fishing, this economic activity grew progressively during the second half of the 20th century. With the construction of roads, the physical connectivity to the northern cities of Manta and Portoviejo improved. A milestone in the history of this town that helps to explain its physical isolation by terrestrial connectivity, was the arrival for the first time of a public transport bus in 1974. This event marked a *before and after* of the terrestrial communication with the rest of the country. The local system of settlements began to be connected with other towns and cities, which meant an increase of exchange of population, goods, services and information flows. Domestic tourism and subsequently international visitors arrived at this pristine and exotic natural landscape.

New commerce networks related to marine products were built and extended to the regional and national level. Fishing merchants arrived from the northern cities to buy fresh seafood directly on the beach to transport and sell it to the largest wholesale markets. The fishing village transformed slowly into a town with a first rectangular urban form composed by vast and extended plots. The rustic blocks and streets were adapted to the geographical morphology of the site and expanded along the beach to the north and followed the paths of two small rain-season rivers to the west in a direction to the *Agua Blanca Valley*. In the beginning, the hilly landscape that surrounded the flat area along the beach was a physical limitation. Additionally, it is important to observe the existence of a mangrove forest at the mouth of both rivers in the central and northern sections of the beach. In the 1950s, the first trawling fishing boats began to operate in Puerto Lopez. Despite the lack of a basic port infrastructure, the trawling boats concentrated their activities in the Puerto Lopez Bay due to the tranquillity of its waters and the abundance of marine species nearby. Puerto Lopez started to be known as a local fishing port for artisanal and industrial fisheries, and at the same time, as a centre of supply and distribution of fisheries products.

In 1979, the Machalilla National Park was officially created and demarcated as a national park with a total surface of 55,000 hectares. Likewise, a progressive promotion of the coastal region as an attraction for the ecotourism was spread. Nevertheless, the deficient connectivity to other cities kept the low number of visitors, and subsequently the lack of private investment in tourist infrastructure. In 1994, Puerto Lopez was legally declared a new canton of the Manabí Province. This new political-administrative status signified for Puerto Lopez, to have the legal power to plan its urban development as a municipality. Nevertheless, it also meant the

construction of new social networks and structures dependent on the political power locally and regionally (Figure 62).

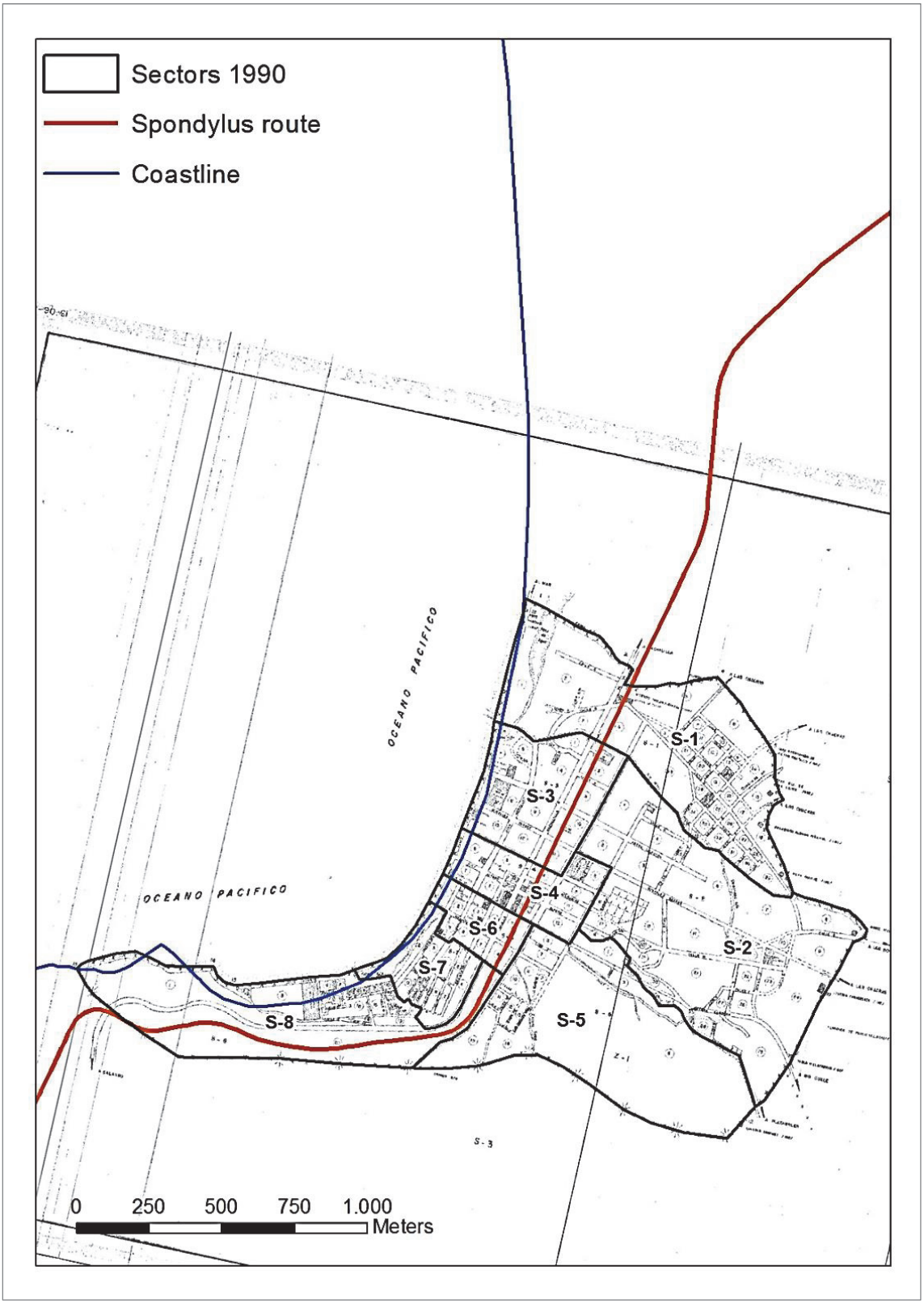


Figure 62: Puerto Lopez in 1990 (Source: Own draft based on scanned census map INEC, 1990)

6.2.5. The contemporary tourist destination and settlement (1995 - 2010)

In the 1980s, Puerto Lopez was one more of the hundreds of small fishing towns localised along the central Ecuadorian coast, but it was not until the middle of the 90s that its name began to appear frequently in the list of the Ecuadorian coastal tourist destinations (Figure 63).

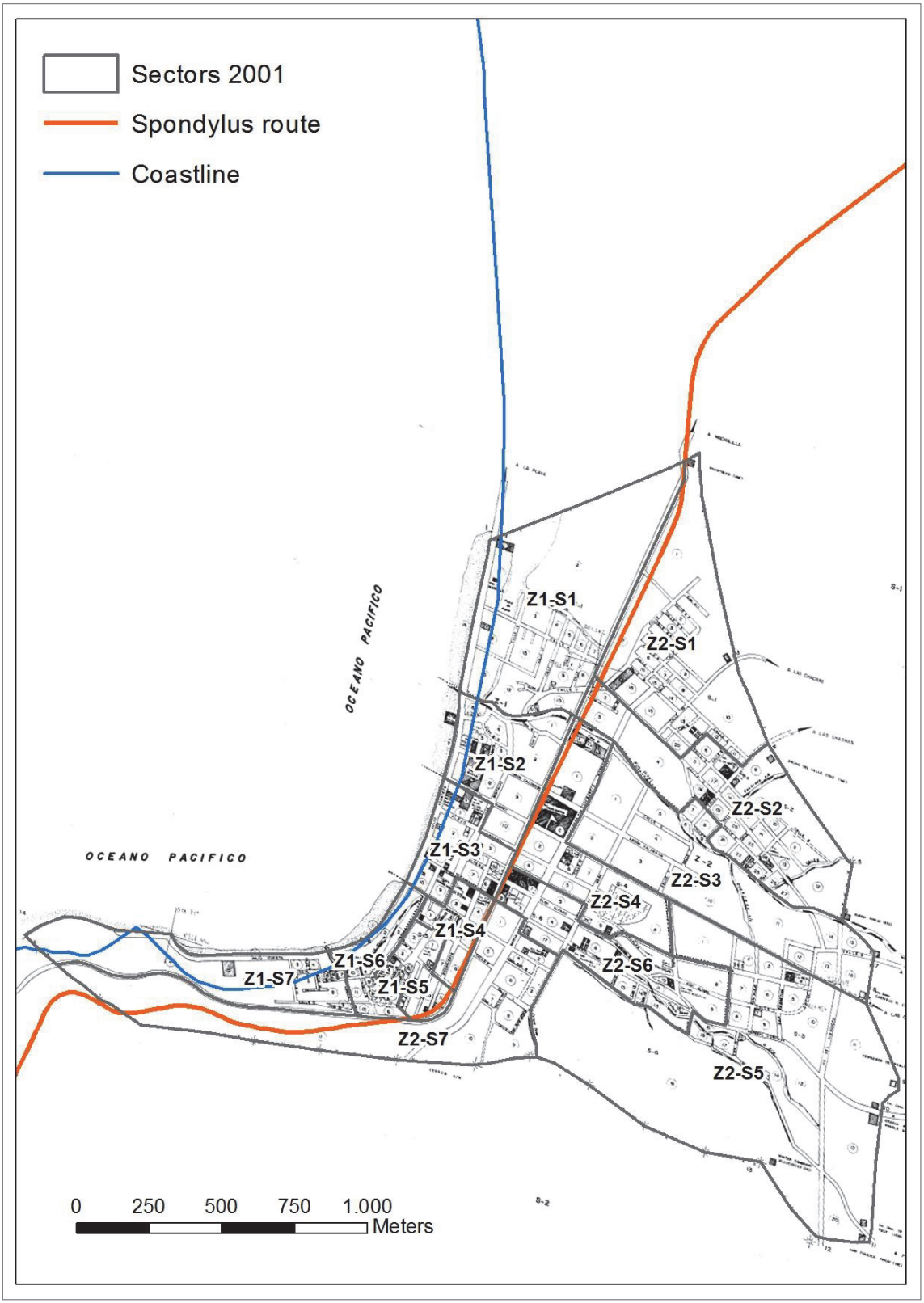


Figure 63: Puerto Lopez in 2001 (Source: Own draft based on scanned census map INEC, 2001)

When the Spondylus Route was improved and extended to the north, domestic and international tourism flows began to spread from the southern tourist beach city of Salinas and the northern port city of Manta. In 1994, Puerto Lopez was designated officially as a canton. Despite the fact that it did not have the minimum legal quantity of population, this designation meant the formal recognition of Puerto Lopez as a small coastal city with its municipality. The first flows of national and international tourists began to arrive in Puerto Lopez in the middle of the 90s. They came to visit the Machalilla National Park to experience the still rural and idyllic natural landscape. The most important tourist activity that attracted the majority of visitors and was popularised rapidly by the informal tourist market was the boat tours to observe the humpback whales (Harris et al., 2004). In 2001, Puerto Lopez was officially on the tourist maps promoted to attract the domestic and international tourism along the coastal region. Changes of the urban border were not significant.

In 2012, the official designation of Puerto Lopez as the first pilot project of the program ATP (Tourist Protected Areas) meant the imminent arrival of public investments in basic infrastructure oriented to trigger social and economic development by ecotourism. Nevertheless, the complex interplay between inhabitants and natural landscape, and the conditions of social vulnerability and exposure to natural disasters did not change drastically. The main arguments to ground this first assertion were visible after the destructive earthquake on April 2016. Nowadays (2015), Puerto Lopez is still transforming intensively. The increase of urban surface at peripheries (1990-2010) and the intensive parcelling of plots inside the urban border (2009-2012) are tangible evidence, which demonstrates that this town is still evolving and transforming from a fishing village to a small globalised ecotourism city or beach resort (Figure 64).

Figure 64: Promotion of Puerto Lopez as a Tourist Protected Area (Photo: Pozo, 2015)

Flows of domestic and international tourists have risen for the last decade in Puerto Lopez. The capital city of the canton has consolidated as the centre of leisure activities related to ecotourism and beach tourism. Its proximity to the Machalilla National Park and the predominance of rustic rural ways of life in settlements are the main magnets that attract visitors every year. Despite the lack of luxurious resorts and the deficient quality of the built environment of the city, around 40,000 tourists arrived in Puerto Lopez in 2014. The main natural spectacle to observe is the humpback whales, which each year arrive at the tropical southern Pacific coasts to reproduce. For the last 15 years, the number of whale-observers has grown exponentially. While in 2000 around 4,000 tourists visited Puerto Lopez to attend this specific tourist activity, in 2015 there were 69,279 (El Telégrafo, 2016). The majority of them were national visitors: 70% were Ecuadorians and the rest 30% were foreigners (MINTUR, 2009) (GAD Municipal Puerto Lopez, 2015).

For Puerto Lopez and many other fishing towns settled along the central coastline, the last 25 years were characterised by a rapid crossing from rural to urban ways of life. Urbanisation was accelerated by the arrival of tourism and its consolidation as a new economic activity. Even though the settlement named today as Puerto Lopez has more than 3,000 years of history, the last two decades have been the most transformative period of all of them. Particularly, between the years 2001 and 2010, the urban area of this fishing town has expanded to the northern and eastern peripheries. By comparing the official maps of the 2001s and 2010s national censuses, the new expansion areas can be observed and demarcated (Figure 63 and Figure 65).

Figure 65: Puerto Lopez in 2010 (Source: Own draft based on scanned census map INEC, 2010)

6.3. Transformation of the physical and social space: 1990 - 2010

6.3.1. Observing the urban growth at the sectoral scale

In 1990, Puerto Lopez was shaped by only one zone and eight sectors, which in total summed 204 hectares of urban surface and 5,675 inhabitants. In 2001, one new zone and six new sectors were added. In the 2010 census, the city comprised 2 zones and 18 urban sectors inside its urban boundaries, which reaches 383 hectares and 9,854 inhabitants (Figure 66).

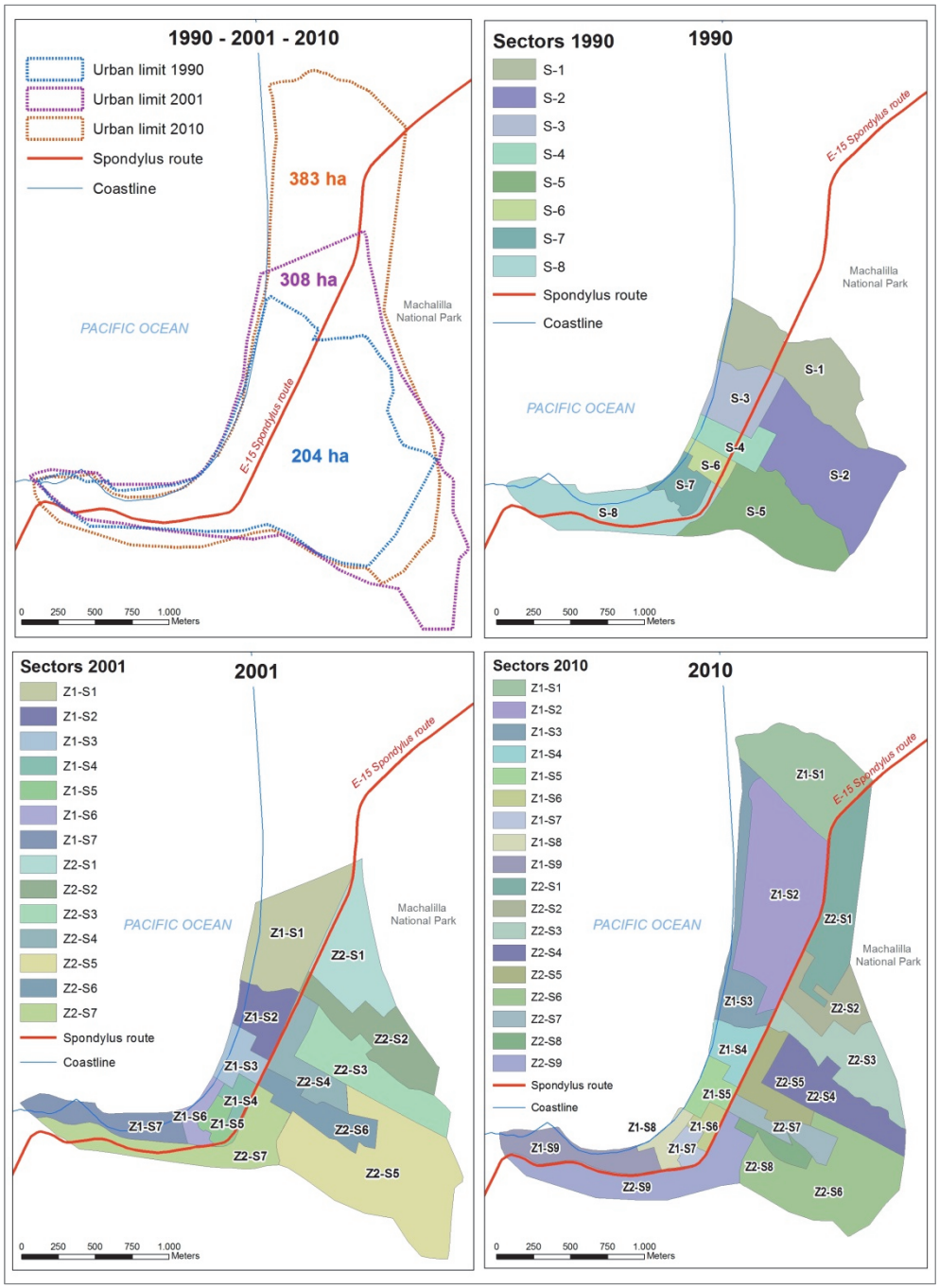


Figure 66: Puerto Lopez, urban sectors 1990, 2001, and 2010 (Source: Own draft, 2016)

6.3.2. Population, surface, and density

The last two decades (1990-2001 and 2001-2010) experienced both an increase in population and an extension of the urban area. According to the national census (2010), between 1990 and 2010 the number of inhabitants and houses increased at a rate of 1.73% and 2.44%, respectively. The urban surface was extended from 203.74 to 383.07 hectares (Table 17). Likewise, the official urban border was significantly expanded two times since 1990.

Variable / Years	1990	2001	2010	Rate 1990-2010
Population	5,675	7,720	9,854	1.73%
Urban surface (ha)	203.74	308	383.07	1.88%
Number of houses	984	1,610	2,403	2.44%

Table 17: Population, urban surface and number of houses Puerto Lopez (Source: INEC, 2010)

As it was previously mentioned in the Chapter 3, the urban sectors were defined by the INEC based on logistical and functional reasons related to the operability of the respective national censuses. The main criterion to demarcate each sector was the number of houses and buildings (between 100 and 250). For this reason, changes in the concentration and dispersion of buildings and persons can be identified by observing the diversity of forms and surfaces of urban sectors.

Shorter areas with rectangular forms mean concentration of buildings in more physically consolidated urban areas (like the downtown and its peripheral neighbourhoods), while larger surfaces with organic forms tend to correspond to new expansion areas, specifically on the eastern and northern urban borders (informal housing, new tourist resorts and new homes projects in peripheries). The changes produced in population density per sectors for the last two decades clarify the process of internal mutation of this coastal city from rural to urban. The gradual densification in the downtown and in the eastern and northern peripheral areas describes the process of settling and urban growth of Puerto Lopez since 1990 until today.

The highest levels of population density have been located in the downtown for the last two decades. Particularly, in 1990 the sectors S-6 and S-7 were the most populated. In 2001, population density was dispersed in the downtown sectors and over the surrounding periphery. The main hotspots were the southern and central sections of the coastline and the eastern side of the Spondylus Route. In 2010, the urban area expanded over the east and northern natural landscapes. Basically, the new urban sectors had low density of population, while the downtown and the sectors near the Spondylus Route had the highest levels (Figure 67).

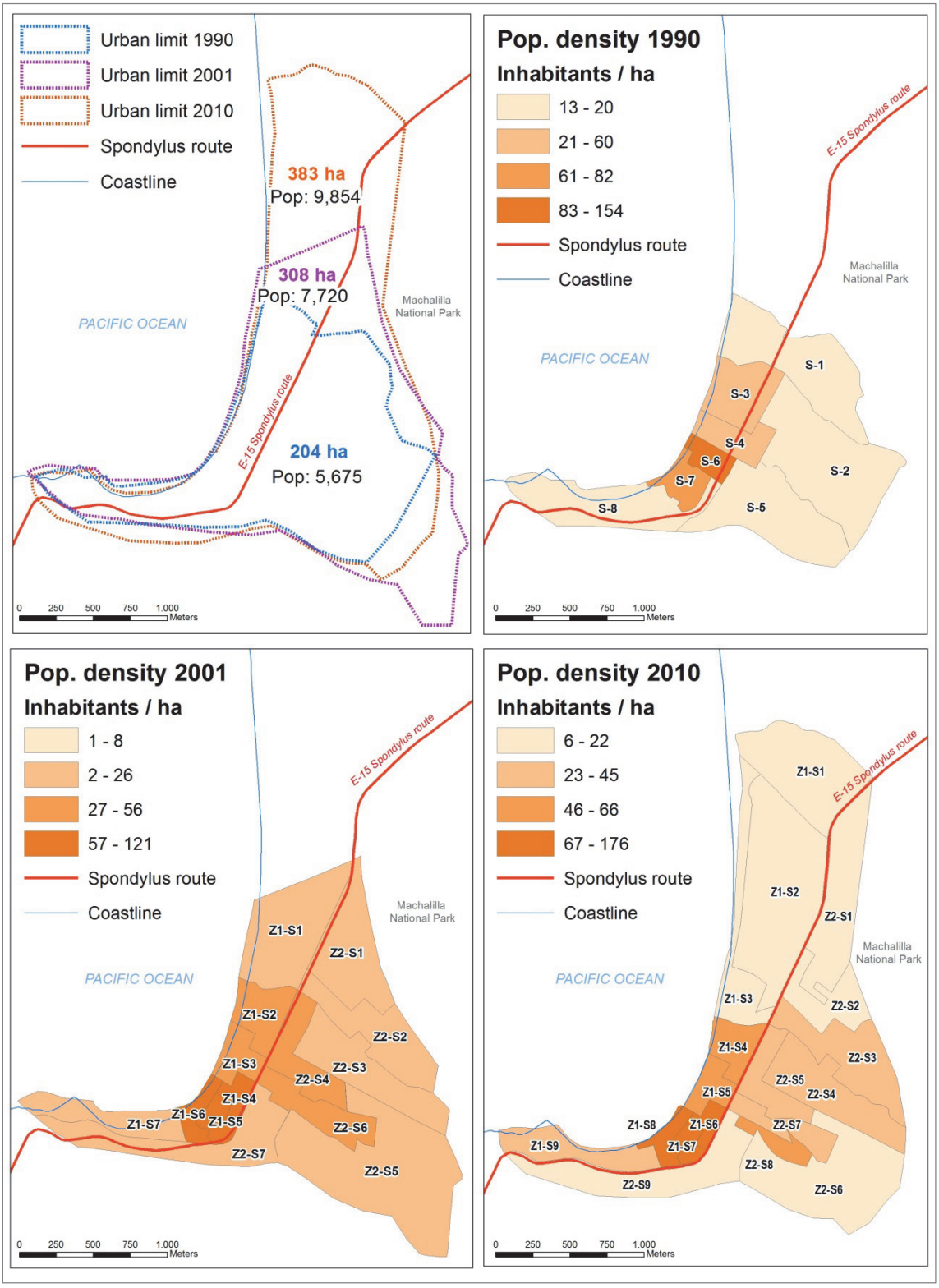


Figure 67: Population density per sectors 1990, 2001, and 2010 (Source: Own draft, 2016)

Likewise, the construction of new houses spread from the flat downtown to the northern and south-eastern hilly areas. Densification in the downtown has increased constantly from 26 houses per hectare in 1990, to 38 houses per hectare in 2010 (Figure 68).

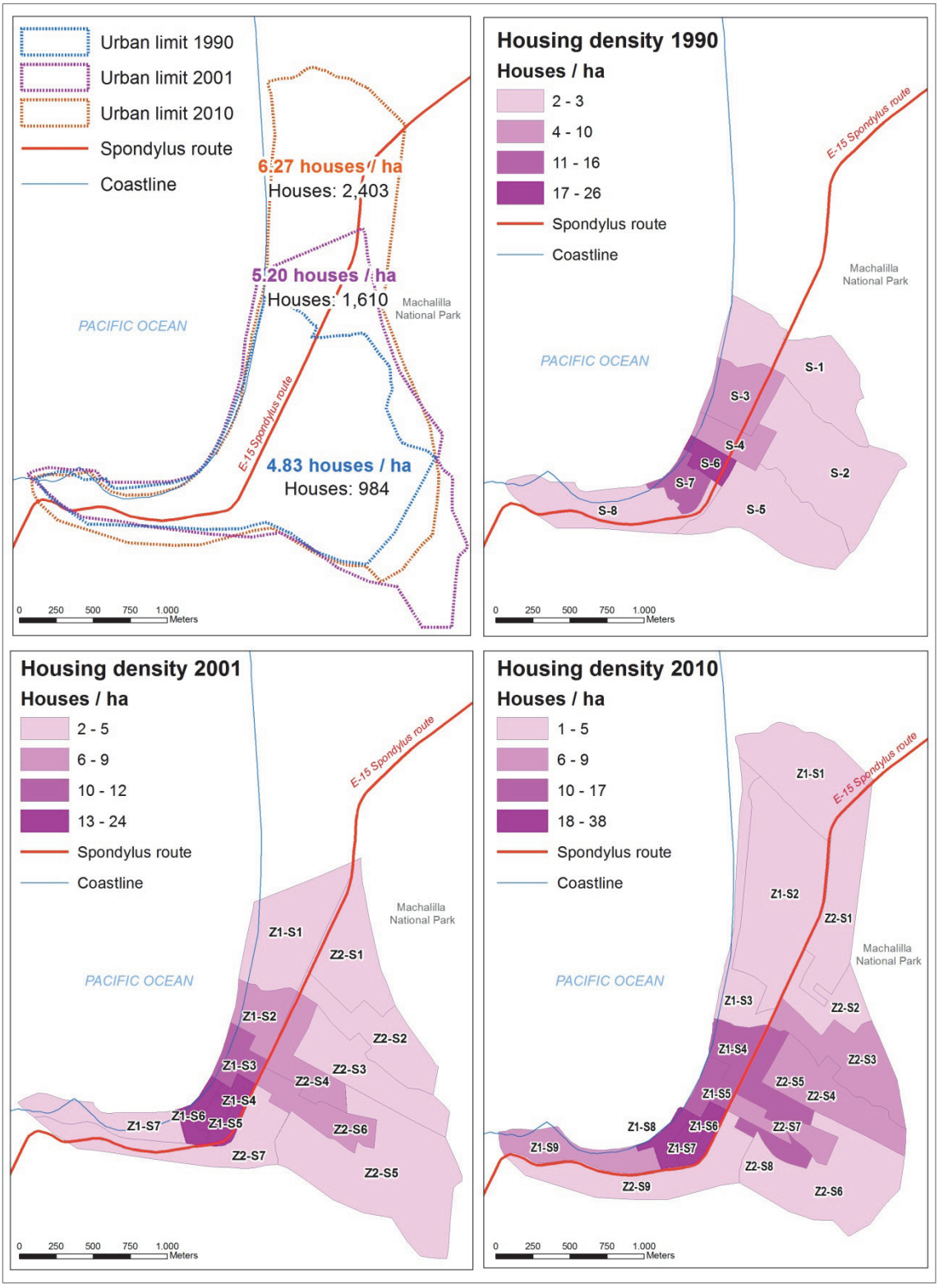


Figure 68: Housing density per sectors 1990, 2001, and 2010 (Source: Own draft, 2016)

Due to the diverse topography of the location and the bad quality of the eastern soil, the urban growth of Puerto Lopez has been characterised by three main dynamics or urban patterns of growth for the last two decades: the intensive densification and parcelling of the downtown; the progressive consolidation of a residential fringe-belt; and the urban expansion of the flat northern land and to the hilly eastern areas.

The speed of this phenomenon alongside with a weak regional and urban planning triggered several negative impacts on the natural and historical heritage (Pozo, et al., 2014). Particularly, eastern expansion areas have been constantly pushing the border that separates the city from the Machalilla National Park, as well as destroying invaluable archaeological remains of ancient civilisations in its path. The archaeologist Richard Lunniss and other local and foreign research institutions have constantly been reporting this destruction since the 1980s. Nevertheless, the "tsunami of urban growth" (formal and informal) has been always more powerful and rapid than any capacity of reaction (Lunniss, 2014) (Figure 69).

Figure 69: Destruction of archaeological remains by bulldozing (Source: Lunniss, 2014, p. 6[34])

As Lunniss (2014) identified in several scientific reports and articles related to the destruction of archaeological remains along the central Ecuadorian coastal region, the weak connection of the native and new citizens with their pre-Hispanic past has contributed to the devaluation of the local heritage. Natives, as well as new citizens who live in Puerto Lopez, do not appreciate the archaeological remains that can easily be found under their plots and houses. When they build their houses, most of them destroy the pieces or keep some as a souvenir. They do not communicate to the INPC (National Institute of Cultural Heritage) due to the risk of an intervention and prohibition of construction (Lunniss, 2014).

Specifically, on the eastern side of Puerto Lopez (Lopez Viejo), the process of formal and informal urban growth has been destroying and covering the physical evidence of the pre-Hispanic settlement Cercapez. Despite the identification and mapping of ancient stone structures by archaeologists in 1979, the intense pressure for new building plots was stronger than any official or non-official initiative to protect them. Nowadays, the *Buenos Aires*, *Corazón de Jesús*, *Parque de la Madre*, and *Miramar* neighbourhoods are settled over several shapes of history and identity (Lunniss, 2014).

[34] Approximately one hectare of natural landscape was bulldozed in the eastern periphery of Puerto Lopez on May 2013 (14 de Junio neighbourhood) (Photos: Richard Lunniss, 2013). Archaeological remains were totally destroyed by the bulldozing of the area (Photos: Richard Lunniss, 2013).

On the one hand, the national and local government have been seeking to trigger socio-economic development by promoting Puerto Lopez as an international ecotourism destination. But their efforts to protect its strongest marketing products (nature and archaeology) have been traditionally weak. In other words, Puerto Lopez has been destroying precisely what makes it special and unique for visitors. This dynamic will continue with more intensive patterns for the next decades if global tourism increases and urban planning is not improved wisely (Pozo, et al., 2014). With the implementation of the program "Tourist Protected Areas" in 2012, the national government sought to intervene directly in the urban planning of Puerto Lopez to boost the process of planning and design of Puerto Lopez as the first sustainable ecotourism destination in Ecuador.

A first regulatory framework was created to control adverse impacts of tourism and to organise the process of planning. The processes of buying and selling new plots and macro plots inside and outside the urban area have been prohibited for a period. However, according to the opinion of several locals interviewed, the land market has been expanding with the same and even more rapid dynamics. The expectative of the oncoming public investment on tourist infrastructure by the national government and the consequent rise of private investment by foreign investors fuelled the local land and building markets (Pozo , Ramírez, Saltos, & Vargas, 2014).

6.3.3. Poverty, vulnerability, and informality

Since 2010 the national government of Ecuador measures poverty using the Unsatisfied Basic Needs (UBN) index, which focuses on the core priorities that a family and a person need to achieve the *well-being*. The majority of the indicators correspond to basic services, but there are also others related to global human rights like education, health and labour. This index differentiates itself from the traditional poverty-by-income index regarding evaluating the accessibility to basic services and rights instead of focussing only on the money income (INEC, 2010).

In the case of Puerto Lopez, poverty has been a constant characteristic for the last decades. For the period 2001-2010 the process of decreasing it was marginal. The high quantity of inhabitants living in poverty does not correspond to the positive visions of common prosperity and growth traditionally promoted by politicians. According to the PDOT-2015, the level of UBN poverty has decreased by just 6.80% in ten years and that of UBN extreme poverty by 18.20% (Table 18).

Poverty/years	2001	2010	2001-2010 Variation
Poverty by UBN	97.60%	90.80%	- 6.80%
Extreme poverty by UBN	66.50%	48.30%	- 18.20%

Table 18: Poverty and extreme poverty 2001-2010 (Source: GAD Puerto Lopez, 2015)

This fact expressed itself in the physical quality of the houses inside the urban area of Puerto Lopez. According to the 2010 national census, 32.47% of a total of 2,675 houses did not fulfil the minimum habitability conditions and could not be repaired, 42.84% could be repaired, and just 24.69% had acceptable habitability condition. Additionally, the quantitative housing deficit was 42.84%, and the qualitative was 32.47% (GAD Municipal Puerto Lopez, 2015, p. 189). In other words, the high exposure levels of the built environment and the increase of natural disasters due to climate change, raise the physical vulnerability of Puerto Lopez.

The informal and gradual self-construction of houses concentrated in the eastern areas of urban expansion (zone 2, sectors 6 and 3) and also is focussed in some specific neighbourhoods in the fringe belt (zone 1, sector 7). In 2010, the dwellings with external walls of the lowest quality were localised in the south-eastern new neighbourhoods of *Miramar, San Alejo, 4 de Junio* (INEC, 2010) (Figure 70).

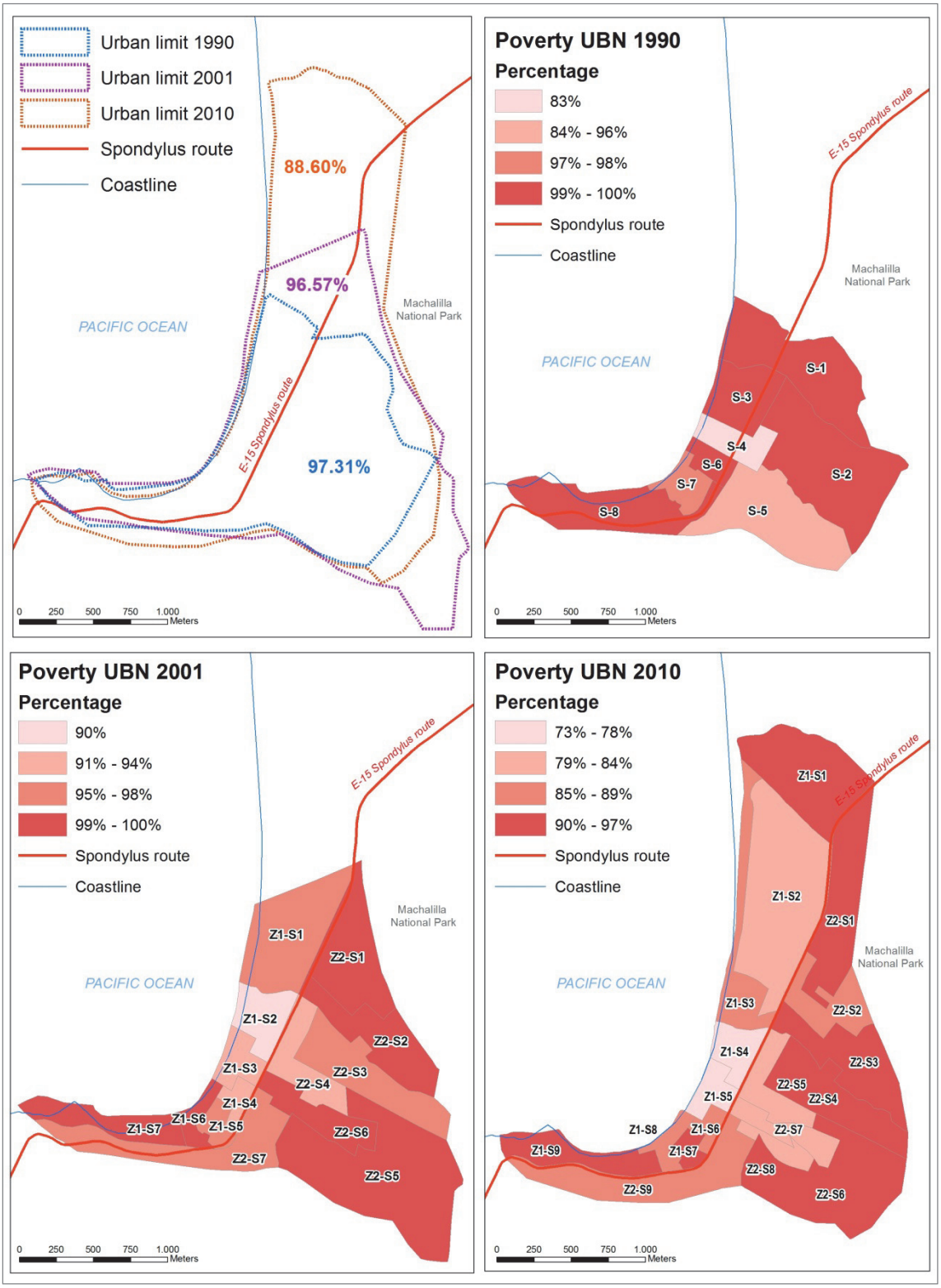


Figure 70: Poverty UBN per urban sectors 1990, 2001, and 2010 (Source: Own draft, 2016)

Although illiteracy has had a modest decrease in the last decades, the concentration of this variable in the new expansion areas in the eastern borders seems to be the consequence of the regional migration of farmers and fishers from the rural settlements system that surrounded Puerto Lopez. Particularly, in the eastern expansion areas (Zone 2: sectors 6, 7 and, 8) the levels of illiteracy in population significantly surpassed the national average of each year (Figure 71).

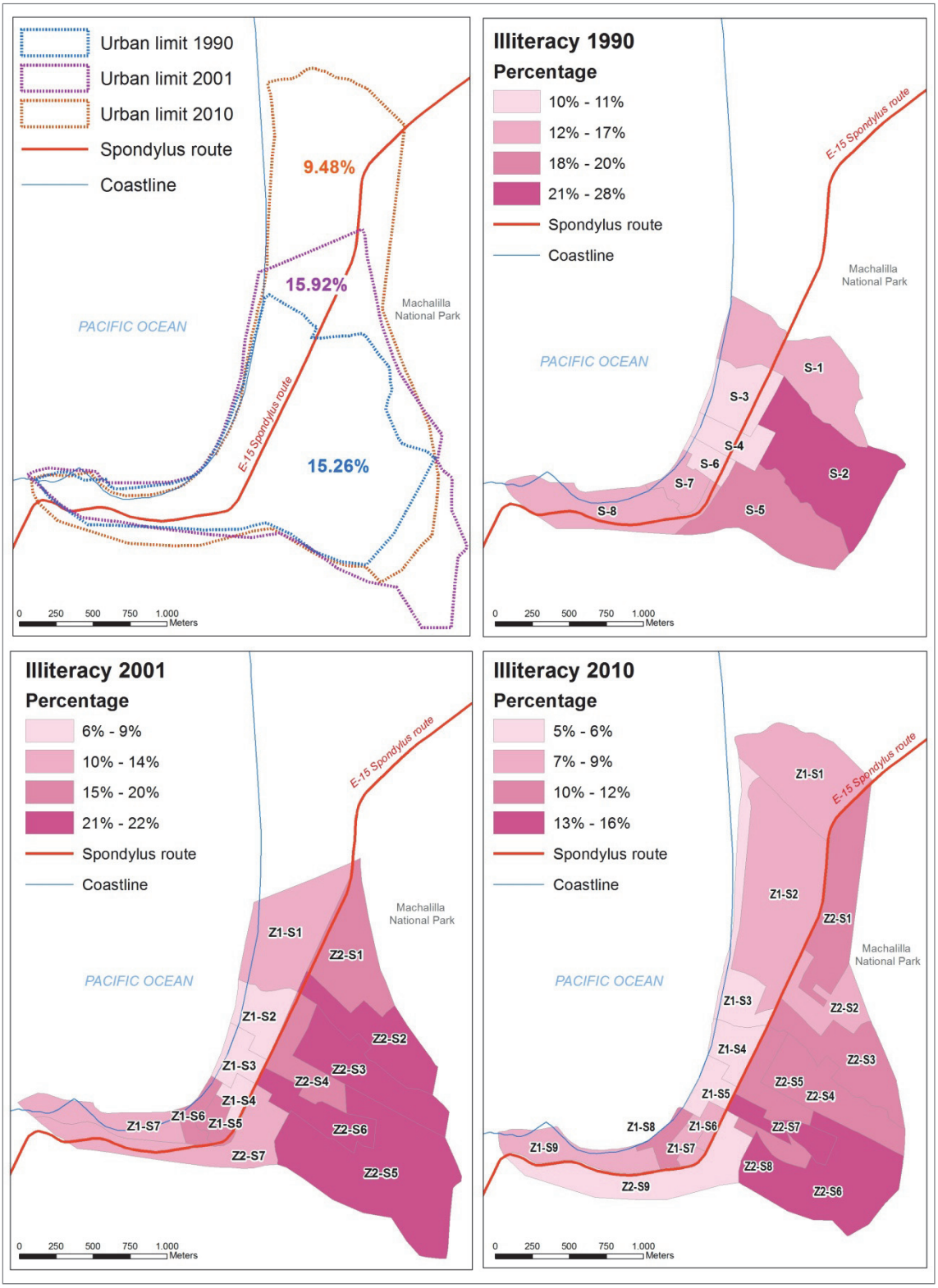


Figure 71: Illiteracy per sectors 1990, 2001, and 2010 (Source: Own draft, 2016)

Another method to observe the process of formal and informal urban growth is to remark the changes on the predominance of construction materials of houses. Specifically, the material of external walls provides a first clue about the progressive evolution of houses from an informal to a formal status in expansion areas (Figure 72 and Figure 73).

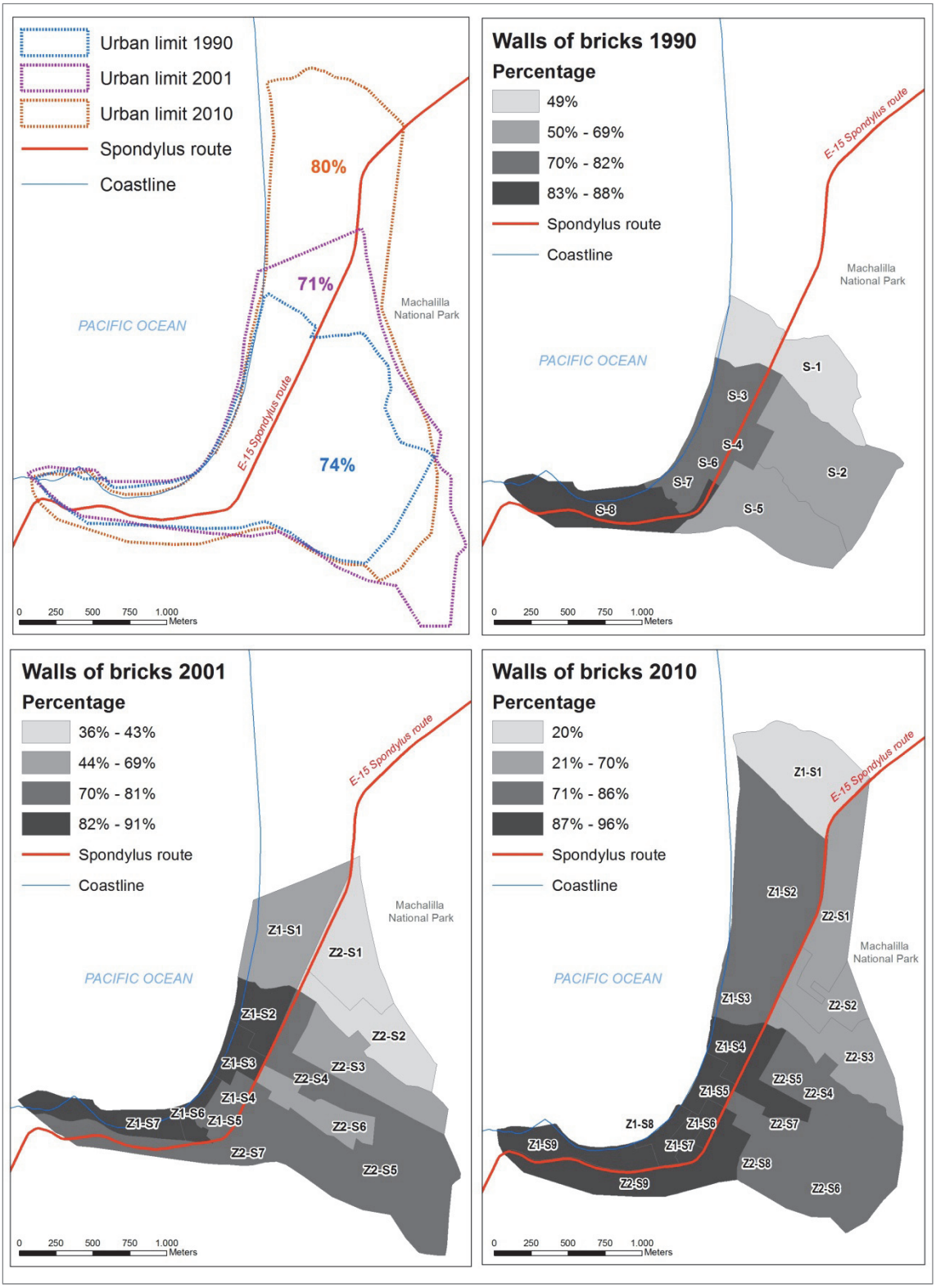


Figure 72: Houses with walls made of bricks 1990, 2001, and 2010 (Source: Own draft, 2016)

The downtown and its immediate periphery have been consolidated rapidly with a predominance of houses with external walls made of cement bricks (Figure 72), while the eastern and northern expansion areas have been characterised by low income housing (Figure 73).

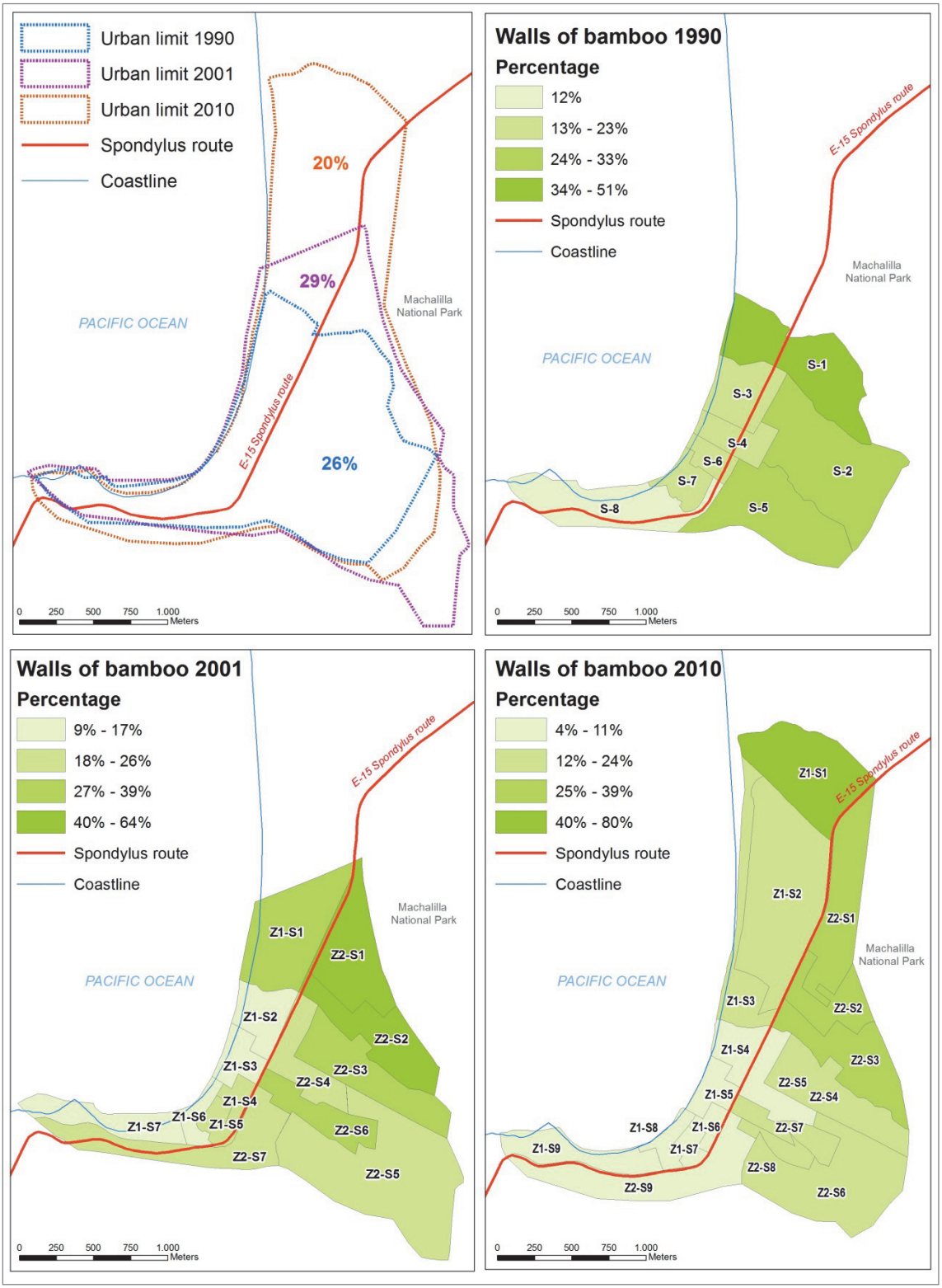


Figure 73: Houses with walls made of adobe, bamboo, wood, or others 1990, 2001, and 2010 (Source: Own draft, 2016)

Self-constructed houses with walls made of bamboo or *caña guadua*[35], combined with a wooden framework, are traditionally the first type of shelter that low income families in rural

[35] "*Guadua angustifolia* is a species of clumping bamboo found from Central to South America" (Source: https://en.wikipedia.org/wiki/Guadua_angustifolia).

areas build (Sainz & Camino, 2014). Gradually, they improve their houses with construction materials based on cement, corrugated steel rods, stone, and sand. Depending on the increase in incomes, the wooden structure is replaced by concrete columns and beams, and walls are entirely renewed by clay or cement bricks. However, this transformation of housing could demand several years, even decades. In 2001 and 2010, the highest percentages of wood-bamboo houses are localised in the eastern and northern sectors or expansion areas of informal housing. These areas are the current hotspots of urban growth and transformation of Puerto Lopez as well as the most vulnerable. Specifically, in the eastern side converge the informal housing and the worst habitability conditions in houses.

Access to basic infrastructure

Puerto Lopez, like almost all the rural settlements localised along the central coastline of Ecuador, has suffered the deficiency of essential services and infrastructure (Wong, 2013). Regarding access to potable piped water, Puerto Lopez has been suffering from this problem for many decades. The main issue is that the whole canton does not have natural sources of fresh water. The flow rate of the two small streams that crosses Puerto Lopez from east to west is too low, and it only activates during the rainy season. Due to the lack of a total coverage of the water provision network (60.55% in 2010) and the instability of the service, inhabitants were accustomed to buying water from tanker trucks.

Nevertheless, the system of water provision by tanker trucks results extremely expensive for local families, and even for tourist resorts. Additionally, this water is not potable, and the process of extracting it usually does not fulfil the technical requirements for human consumption. The 25.10% of the total population, who still bought tanker trucks water in 2010, had to pay four times more money per cubic meter of water in Puerto Lopez than in any of the largest cities in Ecuador, and for a product with a lower quality. In the towns of Ecuador, tap water as well as tanker trucks water is not drinkable. Both have to be boiled before be used for human consumption.

In 2015, the price per cubic meter (1,000 litres) of potable piped water in the most populated cities of Ecuador like Guayaquil and Quito varied between 0.35 and 0.48 US$ (El_Telégrafo, 2015). In coastal towns like Puerto Lopez, where piped water does not exist, it is traditional that tanker trucks fill a plastic barrel from low income families for 1 US$ (Pozo, et al., 2014; Pozo, et al., 2014). This plastic barrel has a maximal capacity of 250 litres, which means that poor rural families are paying around 4.00 US$ per cubic meter of water. However, the access to potable piped water has been slowly increasing for the last two decades in several sectors, especially in the neighbourhood located in the eastern and northern expansion areas. In 2010,

the majority of sectors had between 50% and 81% of houses with access to potable water. The northern sector Z1-S1 has the lowest access to safe drinking water (8.22%) (Figure 74).

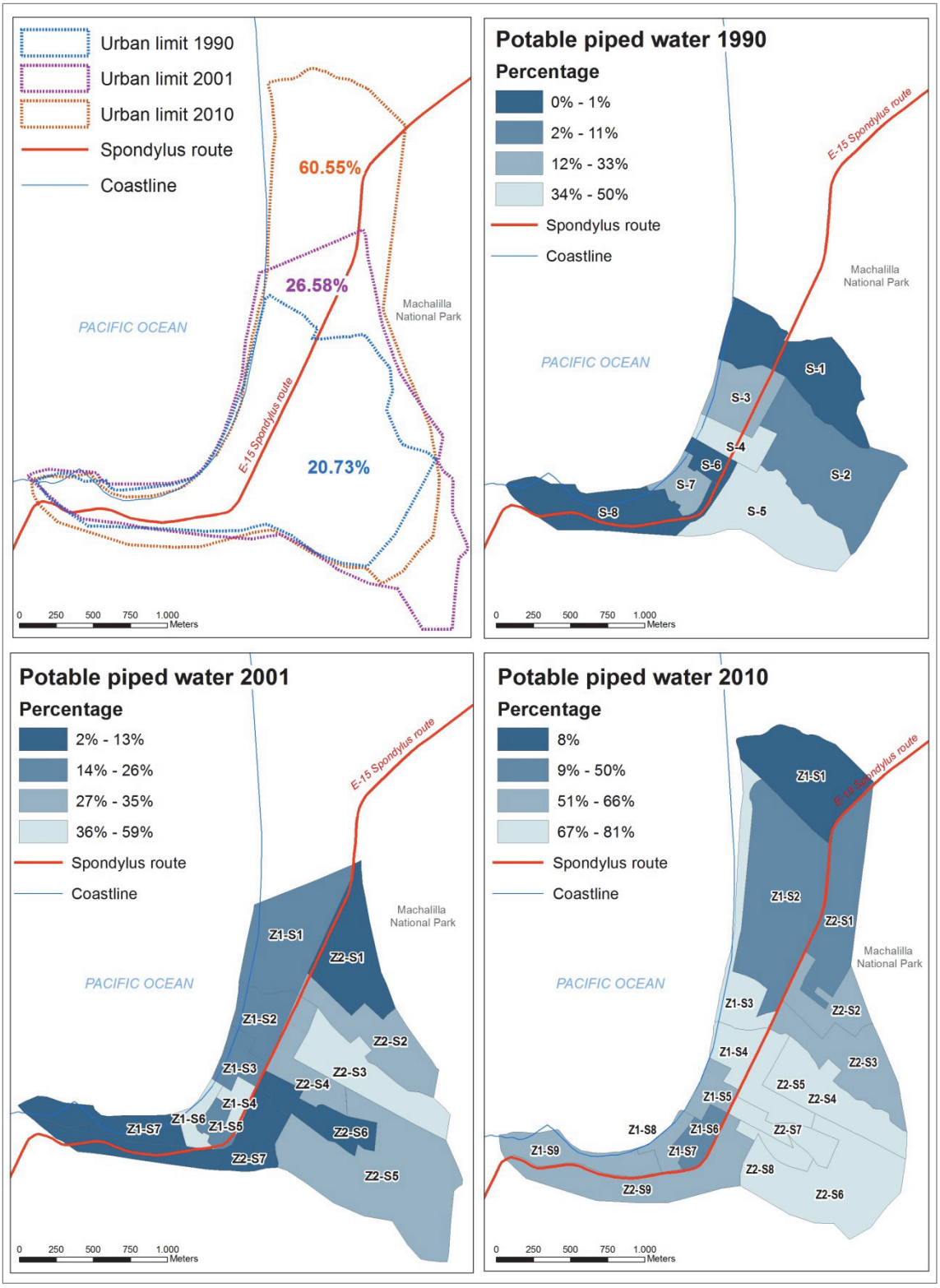


Figure 74: Houses with access to potable piped water 1990, 2001, and 2010 (Source: Own draft, 2016)

The lack of an efficient piped drinking water public network transformed the provision of this basic urban service and essential human right (Habitat, 2013) into a local vicious circle of the

informal market of potable water, where the main clients and victims are the most vulnerable and poor citizens. Evidently, the main consumers of the water tanker trucks are the low income families who are settled and continue settling, in the eastern and northern informal and formal expansion areas. Their illegal situation and the lack of public resources limit their capacity of access to a better quality of life (Figure 75).

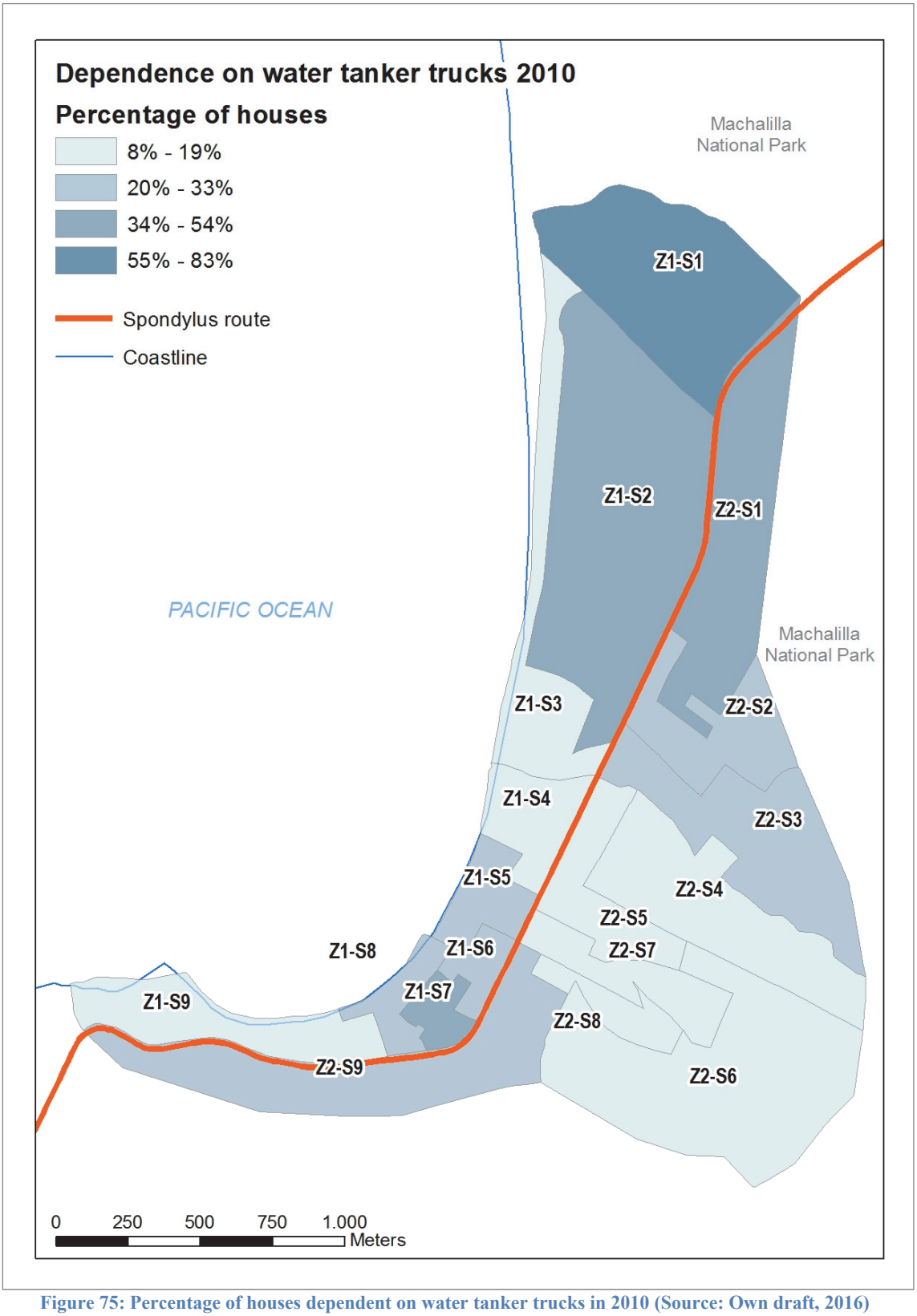


Figure 75: Percentage of houses dependent on water tanker trucks in 2010 (Source: Own draft, 2016)

Due to its geographical location and the characteristics of the landscape (tropical dry forest), Puerto Lopez does not have direct access to natural superficial or underground sources of water like rivers or wells. For the last two decades, potable water has been transported from the southern river *Ayampe* almost 22 kilometres by tanker trucks to the northern towns and villages along the Spondylus Route (El Universo, 2014) (Figure 76).

Figure 76: Water treatment plant near the *Ayampe* River (Source: El Universo, 2014)

Nevertheless, there is a public basic service with the poorest coverage in the town: the sewage system. According to the last PDOT of Puerto Lopez, based on the national census 2010, there are only 0.52% of houses connected to the public sewage system. The 99.48% is connected to private septic tank remaining (46.46%), private cesspit (37.93%), latrine (5.84%), or just has any sanitary system to discharge sewage waters (9.24%) (INEC, 2010). The northern and north-eastern low income neighbourhoods, which have been growing rapidly in an informal and unplanned context, comprise the majority of households that lack this basic service. The massive use of self-constructed latrines, cesspits or septic tanks without technical supervision contributes to the pollution of soil and water bodies by the leakage of wastewater. Extreme poor families, who do not have the resources even to be connected to latrines, discharge their wastewaters into dry riverbeds and ravines.

As a result of the lack of basic services and infrastructure in informal settlements, the levels of exposure and vulnerability to natural disasters increment exponentially. Every rainy season, floods and landslides cause the collapse of the rudimentary sewers and improvised channels, which implies the deterioration of the sanitary conditions. Regrettably, the disgraceful negligence that characterised the local government's provision of essential services becomes often completely absurd. According to the PDOT 2014-2019, which is the main planning tool elaborated by the municipality, 80% of the sewage pipe network has already completely been

installed in Puerto Lopez. However, it does not work because an oxidation lagoon is still missing (GAD Puerto Lopez, 2015). This situation results unacceptable and unfair, especially for low income families (Figure 77).

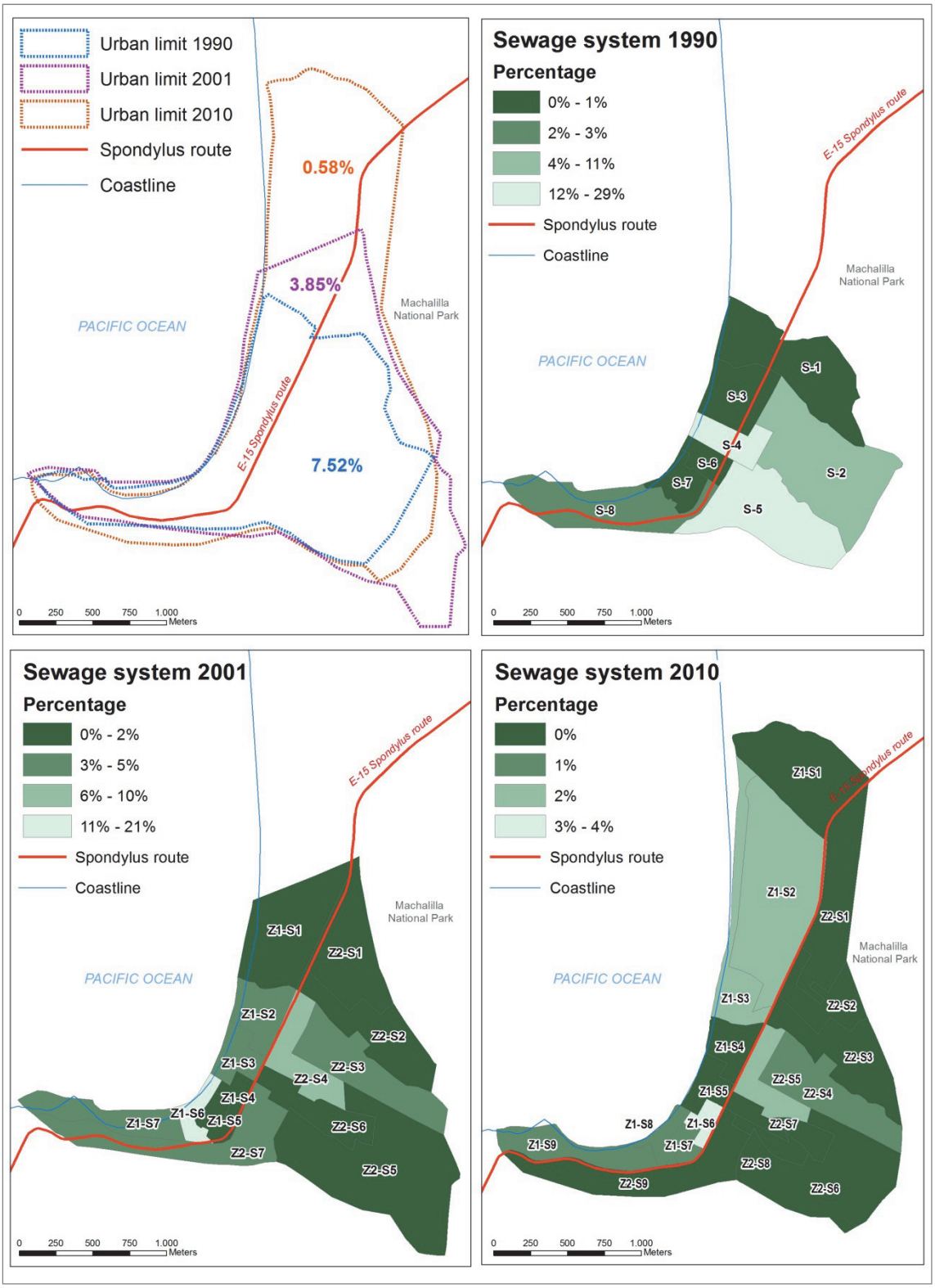


Figure 77: Houses with access to public sewage system 1990, 2001, and 2010 (Source: Own draft, 2016)

However, the other side of the coin is probably more impressive. While almost the half of dwellings does not have access to potable piped water (39.58%), and the majority is not

connected to any public sewage system (99.48%), the private tourist infrastructure has been able to manage these deficiencies successfully. Hotels, hostels and bungalows localised inside the urban area or at the peripheries, offer different levels of comfort to the visitors that, in the socio-economic context of Puerto Lopez, could be interpreted as luxury or opulence. The use of potable water to fill pools and to irrigate vast ornamental green areas is just an example.

Another important public service that has been gradually improved according to statistical data is the solid waste collection. In 1990, just the 41.57% of the houses had access to this municipal service. In 2010, this percentage increased and reached the 97.54% of coverage. However, the subdivision of this variable in urban sectors allows observing the inequalities between the old tourist downtown and the new informal expansion areas at the northern and eastern borders. In 1990, just only the downtown had a partial coverage of the service of solid waste recollection (48%-85%). In the rest of urban sectors, the access to this public service was almost non-existent (0%-13%). Additionally, small cities like Puerto Lopez did not have the capacity to focus public investment on buying garbage collector trucks and complementary equipment. That is why garbage has been traditionally collected manually and with rustic tools. In 2001, with the increase of tourism services and retail in the downtown and along the beach, the access to this public service increased and was improved.

The 92.62% of houses were covered, which meant a huge advance in comparison with the 41.57% in 1990. Nevertheless, the new informal housing located in northern and eastern expansion areas did not benefit from it. Sectors 3 and 5 were the worst with a range between 67% and 88% of houses with access. In 2010, the 97.54% of houses had access to the waste collection service. Principally, the tourist downtown was the most supplied with ranges between 96% and 100%. The eastern and northern sectors had the fewer percentages of coverage (92% and 96%) (Figure 78).

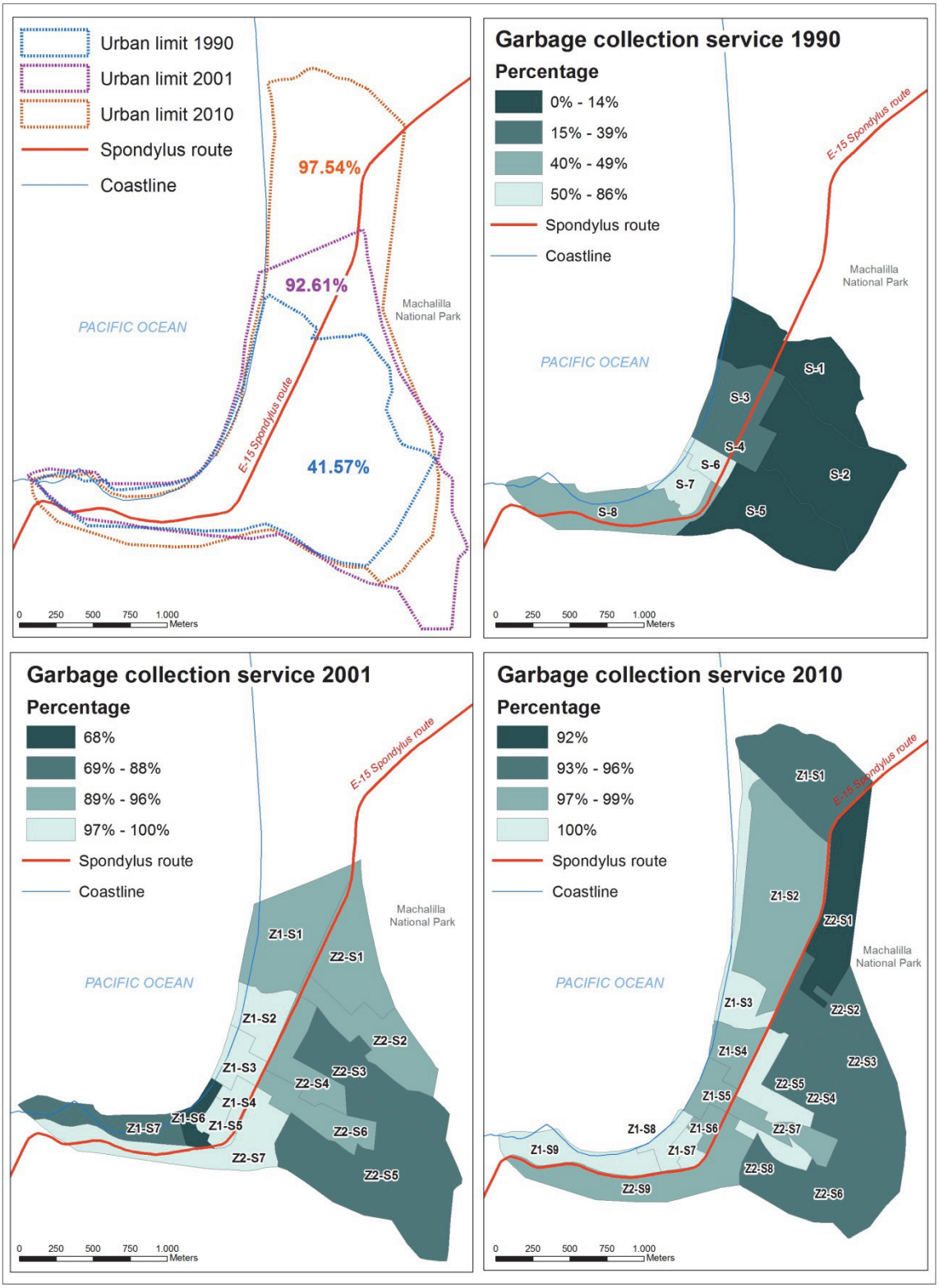


Figure 78: Houses with access to solid waste collection service 1990, 2001, and 2010 (Source: Own draft, 2016)

In 2010, and despite the efforts to improve the public service of solid waste collection by the local government, there are sectors where garbage is still burned, buried, or dumped on raw lands. Particularly, the highest percentages were localised in the sectors along the north-eastern borders of the Machalilla National Park (zone 2, sectors 1, 2, 3, 4, and 6) (Figure 79).

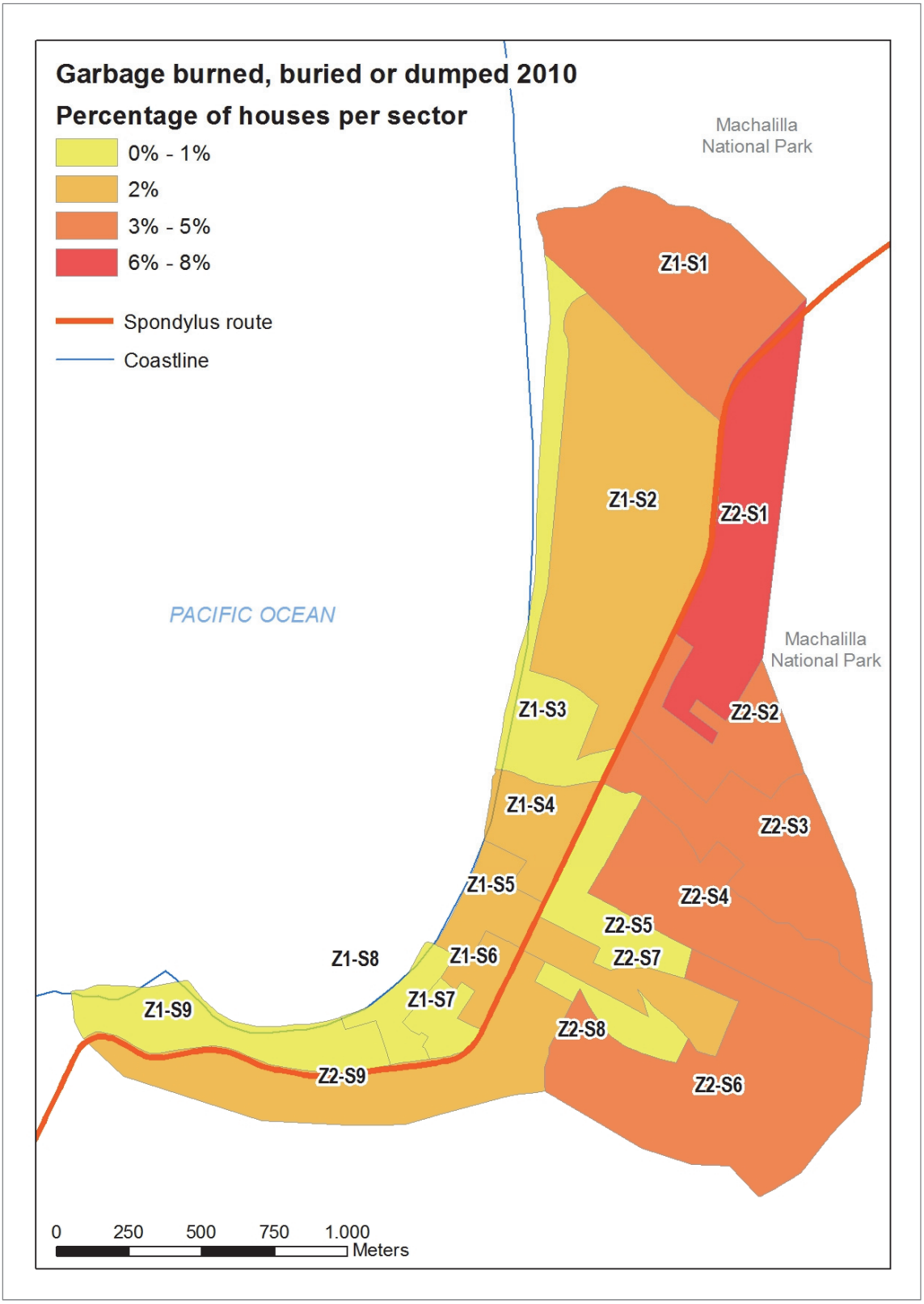


Figure 79: Houses where solid wastes are burned, buried, or dumped onto open land and rivers (Source: Own draft, 2016)

The access to electricity service had a different dynamic. While the percentage of houses with access to this public service increased between 1990 and 2001 (89.53% to 90.87%), for the following decade it did not experience significant changes (90.87% to 90.60%) (Figure 80).

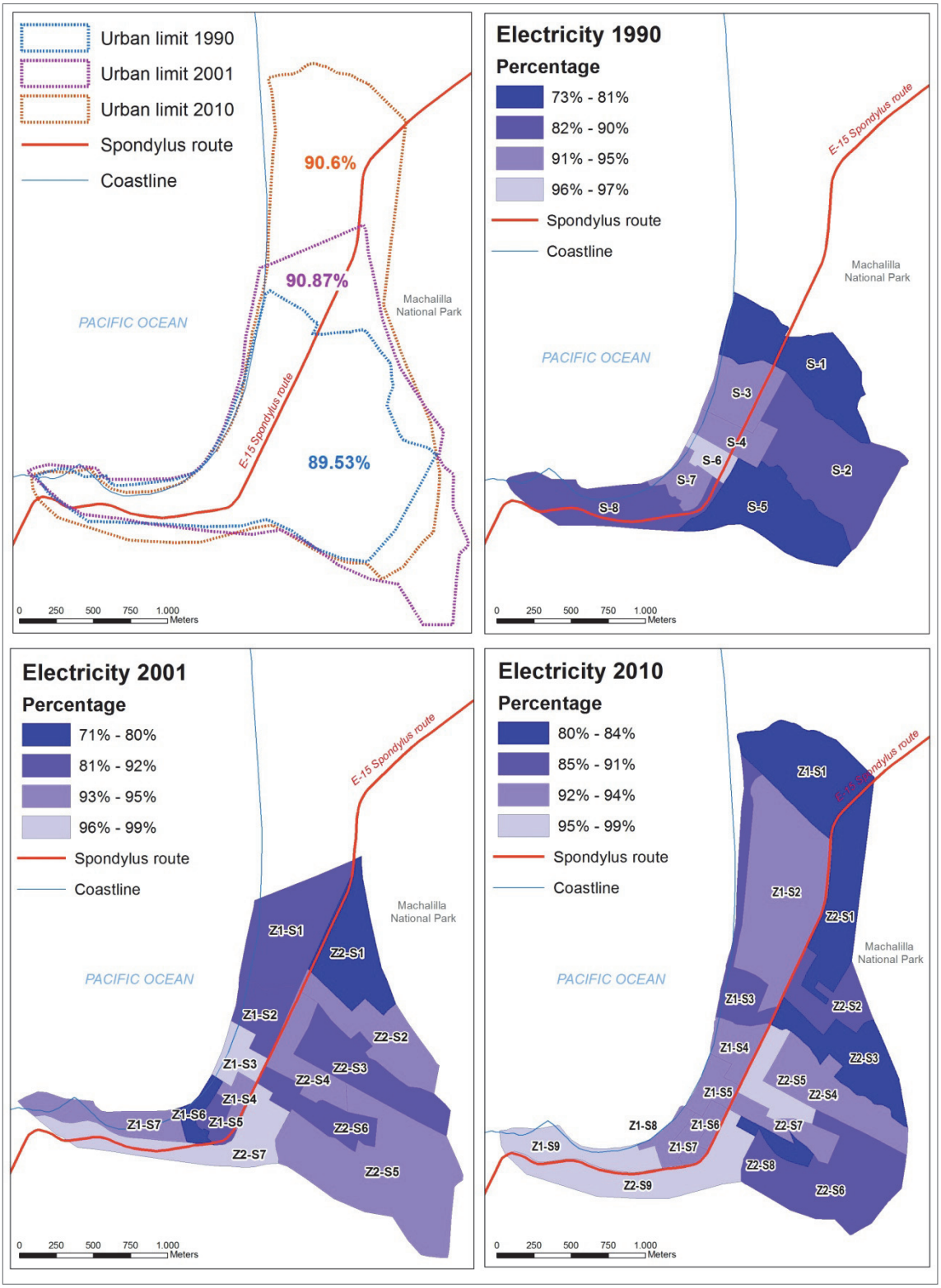


Figure 80: Houses with access to electricity 1990, 2001, and 2010 (Source: Own draft, 2016)

Despite the increase in the number of inhabitants and houses, the percentage of houses with access to electricity remained in a 90% of coverage, particularly in the eastern and northern sectors. The main reason could be the highest percentage of informal connections to the public electricity network. According to the statistical data, in 2010 the 14.84% of the houses with

access to electricity did not have an electricity meter, which means that they were not legally connected to the public network (Figure 81).

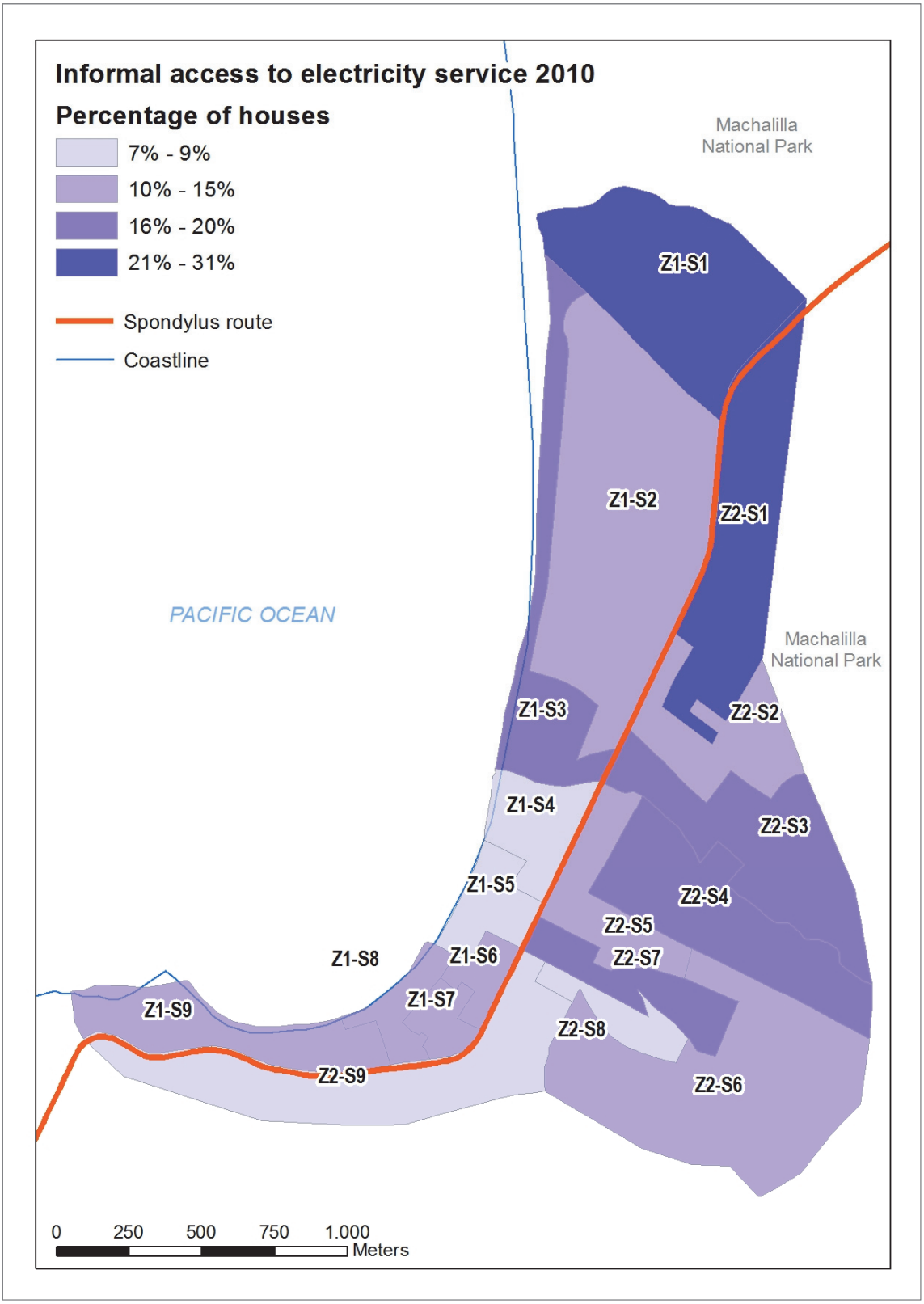


Figure 81: Percentage of houses with access to electricity without a meter (Source: Own draft, 2016)

6.3.4. The old and new local labour market

The transformation of the regional economic geography triggered specific changes in the local job market of Puerto Lopez for the last two decades. The gradual consolidation of tourism as the most representative business along the Spondylus road and in towns like Puerto Lopez contributed to the intertwining of new local-global formal and informal markets and networks. The tourism boom generated the creation of new formal and informal job opportunities, which transformed Puerto Lopez from a traditional rural-urban migration hotspot to a regional rural-rural immigration destination. For the period 2001-2010, the quantity of economically active population (EAP) increased from 39.02% to 45.68%. However, 54.32% of the 2010 total population with the legal age for working does not operate (Table 19).

Variations in the labour market in *Parroquia* Puerto Lopez 2001–2010.						
Indicator/year	**1990[36] Canton**		**2001 Parroquia**		**2010 Parroquia**	
Total population (Parroquia)	-	-	8,679	-	10,928	-
Population > 10 years	-	-	6,712	100%	8,362	100%
Economically active population	-	-	2,619	39.02%	3,820	45.68%
Economically inactive population	-	-	4,093	**60.98%**	4,542	**54.32%**

Table 19: Variations in the labour market, Puerto Lopez (Source: INEC, 2010)

From the group of EAP, the salaried population doubles from 20.34% to 48.74%. At the same time, the population with more than 12 years and with public insurance decreases from 15.67% to 15.16% (Table 20).

Variations in the labour market in *Parroquia* Puerto Lopez 2001–2010						
Indicator/year	**1990 Canton**		**2001 Parroquia**		**2010 Parroquia**	
Economically active population	-	-	2,619	100%	3,820	100%
Occupied population	-	-	2,547	97.25%	3,533	92.49%
Population>12 years, occupied and with public insurance	-	-	398	**15.67%**	535	**15.16%**
Salaried population	-	-	518	20.34%	1,722	48.74%

Table 20: Economically active (EAP), occupied and salaried population (Source: INEC, 2010)

Both statistics explain the high levels informal jobs on the local markets. While the rise of tourism contributed to multiply the quantity of salaried employment in the town, their quality did not improve regarding stability and accessibility to insurance (INEC, 2010). Due to the high percentages of the local population without the specific skills required by international tourism,

[36] In the 1990 national census, the smallest geographical scale with statistical information was the canton. For 2001 and 2010 there is more disaggregated information by *parroquias*. That is the reason why the values in 1990 are not presented.

they do not have accessibility to well-paid labour. Despite the improvement of the labour laws to avoid informality, the quantity of working population with insurance did not undergo significant changes in the last decade. The rise of tourism, as the main economic activity in the region, contributed to the diversification and enlargement of the local market. New economic activities, directly or indirectly related to tourism, emerged and grew. Likewise, traditional activities like artisanal fishing and agriculture diminished. On the other hand, salaried population working in the three economic activities showed positive variations. In the case of primary economic activities, the increase of industrial fishing contributed to the growth of the number of employees with salaries. Equally, the salaried labour in wholesale, in retailing trade, as well as in manufacturing, increased due to the modernization of the local market chains to compete with the global tourist market (Table 21).

	Economic activities	2001	2010	Variation 2001-2010
Occupied population	Agriculture, forestry, hunting & fishing	37.61%	32.04%	- 5.57%
	Wholesale and retail trade	16.76%	18.71%	+ 1.95%
	Manufacturing	5.26%	5.15%	-0.11%
Salaried population	Agriculture, forestry, hunting & fishing	4.24%	16.67%	+12.43%
	Wholesale and retail trade.	1.49%	5.35%	+3.86%
	Manufacturing	1.26%	2.72%	+1.46%

Table 21: Occupied and salaried population by economic activity (Source: INEC, 2010)

The relation between the economic activities and the level of education of the labour force helps to understand the offer and demand of the local market that emerged. In 2010, the population with primary (50.35%) and secondary (20.10%) education work on primary, secondary and tertiary economic activities in a relatively homogeneous distribution. However, the population with higher education (8.11%) lead the demand of jobs in the tertiary sector, which means that well-paid employment and stability are more accessible for skilled workers with a professional title, which, however, comprised only 8.11% of the economically active population in 2010. At the same time, statistics show that the majority of local unskilled workers with low levels of education (70.45%) do not have easy accessibility to the best jobs in the tertiary economy, related directly or indirectly to tourism. In Ecuador, private higher education is expensive and is concentrated in the largest cities. Nevertheless, with the majority of the total population (90.76%) living in poverty, it is almost impossible for a young bachelor student to take the decision to change to other city and to pay for renting and food. Without money, they decide to stay near the family and be part of more accessible economic activities like agriculture and fishing (Harris et al., 2004).

Based on the previous statistics, it may be assumed that the tourism boom has not necessarily been improving the quality of the local labour market and the quality of life of the population. The labour chances and the wealth, which have been produced by this globalised market, have

not been efficiently and homogeneously distributed to the local families. The *trickle-down effect* of wealth is not properly working in this case. The growth of tourism has not been reducing inequality and physical vulnerability. The high percentages of unemployment in the expansion areas are a clear evidence of this phenomenon (Figure 82).

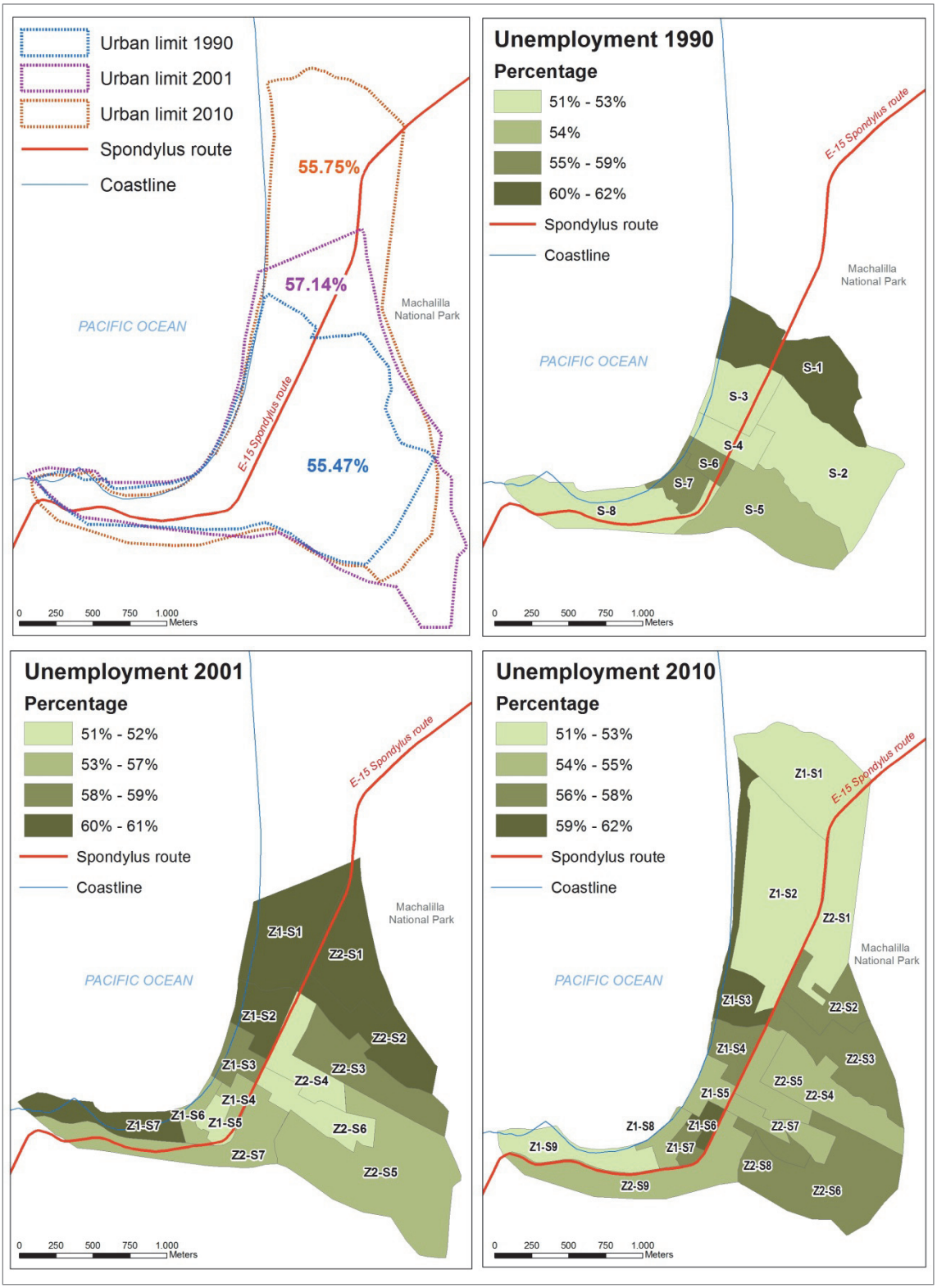


Figure 82: Percentage of persons in unemployment 1990, 2001, and 2010 (Source: Own draft, 2016)

6.3.5. Overlapping vulnerability and exposure (2010)

Statistical information related to vulnerability and exposure distributed per sectors was overlapped to create a multivariate map (Figure 83).

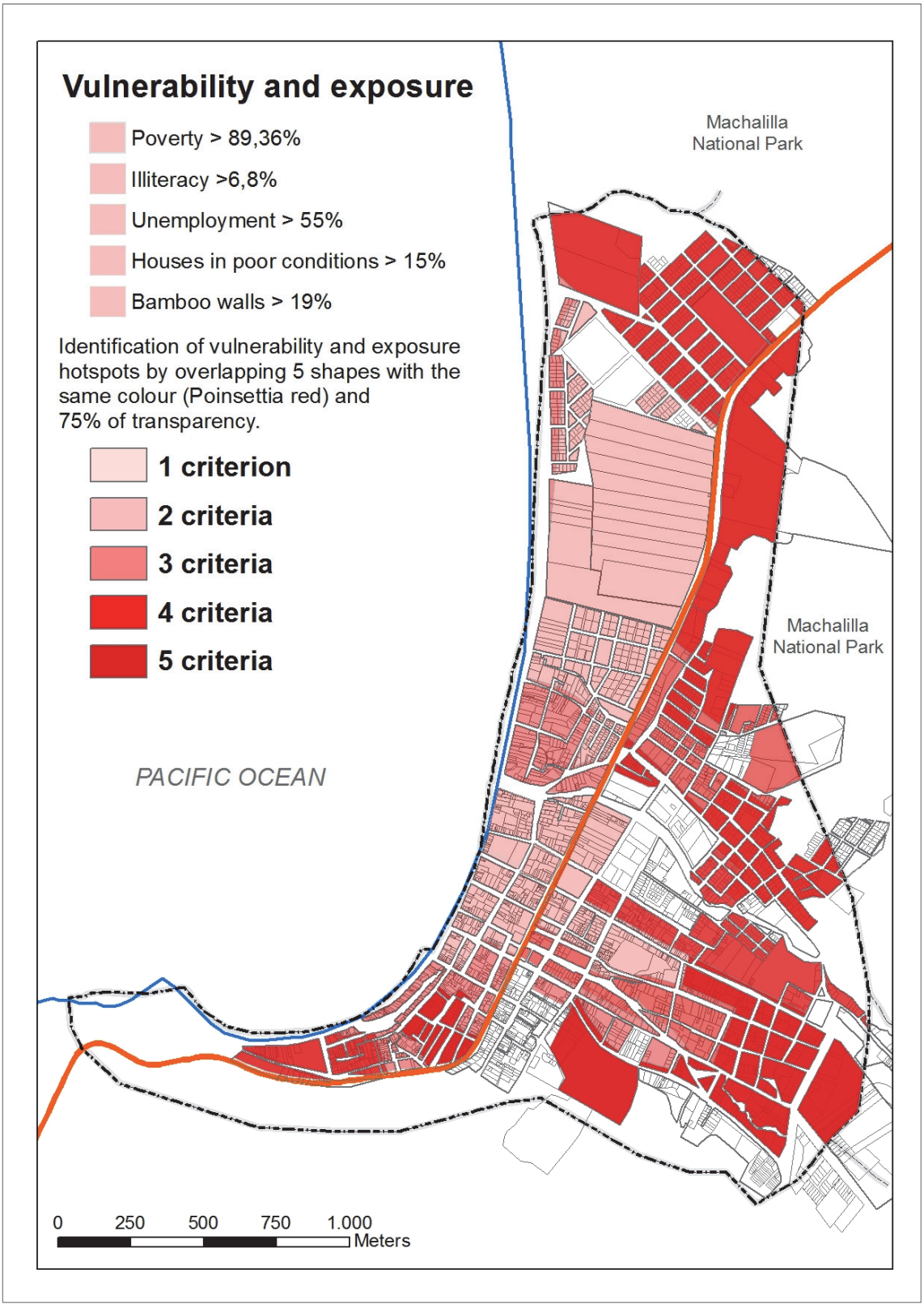


Figure 83: Multivariate map of vulnerability and exposure 2010 (Source: Own draft, 2017)

6.3.6. Palimpsests: forgotten pre-Hispanic shapes under the contemporary landscape

Under this contemporary phenomenon of urban growth and socio-spatial transformations, there are historical landscapes hidden under the currently built space that should not be neglected. These ancient landscapes are also part of complex *palimpsests* of cultures, ways of life, economies, social structures, and urban forms, which have been overlapping for centuries until today (Knox P. L., 2012b; Harris et al., 2004).

Even if the period of study is 1990-2010, the understanding and contrasting of the pre-Hispanic and present ways of life, and the "involution" of the relation between humans and nature, supported strongly the discussion developed in this chapter about the sustainability of the present city and our modern ways of life. The ancient coastal cultures had a strong connection with nature and landscapes based on their identity, religion and traditions (Lunniss, 2014; Bohórquez, 2012; Hidrovo, 2006; Harris et al., 2004). Richard Lunniss (2014), as a passionate archaeologist and citizen of Puerto Lopez, has been studying these ancient connections between humans, nature, landscape, religion, and astronomy since the 1980s.

In his opinion, the contemporary ways of life in towns like Puerto Lopez are totally disconnected of the historical and natural heritage of their ancient natural and built landscapes. The main consequences of this rupture are a weak link with their pre-Hispanic past and consequently, the devaluation of the natural and archaeological heritage by locals and visitors (Lunniss, 2014; McEwan, Silva, & Hudson, 2011; Harris et al., 2004).

The Figure 2 (page 12) helps to explain better the commitment and passion for heritage from Professor Lunniss. On April 2015, he succeeded in temporarily stopping the installation of water and sewage pipes in the coastal town of Salango (near Puerto Lopez) to demonstrate, with a technical process of excavation along the main street, that archaeological pieces and remains were in danger to be destroyed by urbanisation. Unfortunately, he was alone fighting against the "tsunami of urbanisation". The necessity of attracting tourism is bringing paved streets and sidewalks, basic services, and infrastructure to towns, while at the same time is destroying their last roots of identity and evidence of their pre-Hispanic heritage.

6.4. The model of seaside resort formation in Puerto Lopez (1990-2010)

In order to describe the spatial transformation of Puerto Lopez, two models were identified in the literature review related to tourism geography: (1) the model of the time-spatial development of the accommodation business *backward linkages* in an island state of low resources (Vorlaufer, 1996); and (2) the model of beach resort formation (Smith, 1991). Both are complementary, but different in terms of scale and content.

The Vorlaufer model (1996), describes the growth and consolidation of a tourist destination by the *polarisation* and *reversal polarisation* of flows of resources, labour, and capital between a capital city and the tourist destination on a regional scale (Figure 84).

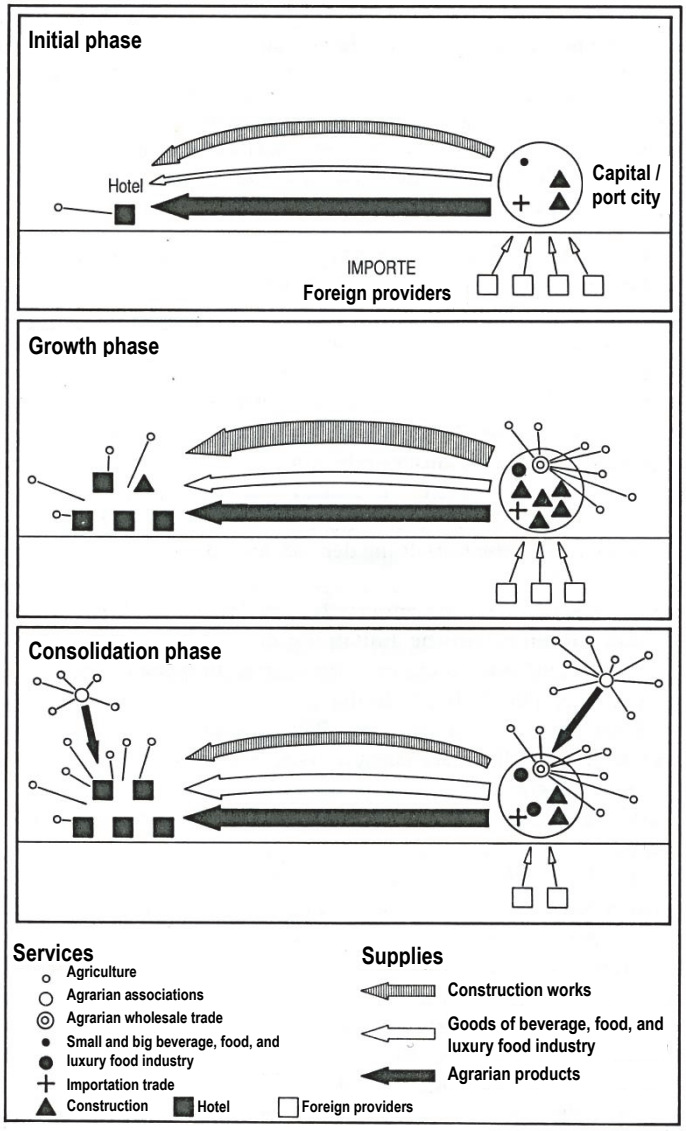


Figure 84: Model of the time-spatial development of the accommodation business "backward linkages" in an island state of low resources (Source: Vorlaufer, 1996, p. 166[37])

[37] "Modell der raumzeitlichen Entfaltung der *backward linkages* des Beherbergungsgewerbes eines ressourcenarmen Inselstaates am Beispiel der Verflechtungen mit der Bau- und Agrarwirtschaft sowie der Getränke-, Nahrungs- und

The *model of a conventional seaside resort* by Smith (1991) (in Williams, 2009, p. 92), represents the progressive transformation of towns or small cities into city resorts. It is an abstract representation of several social and economic processes of transformation that vary according to diverse variables, places, and contexts. However, there are similar general dynamics related to beach tourism that is globally repeated in different forms and intensities (Figure 85).

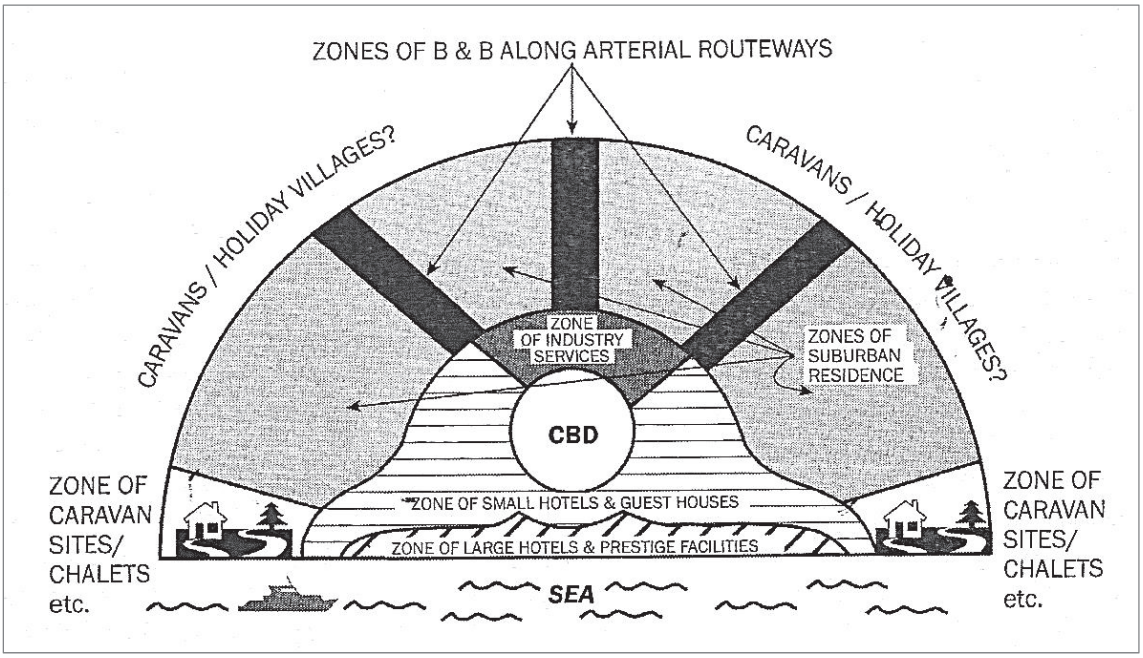


Figure 85: Model of a conventional seaside resort (Source: Smith, 1991 in Williams, 2009, p. 92)

In this model, the locations of the diverse tourist activities, land uses, and infrastructure are distributed by the logic of the land value. The area with the highest value for tourism is the coastline. Large hotels and prestige facilities are located along the beach. The second area of small hotels and guest houses is behind. It has no direct connection to the seaside zone, but it is well connected to the tourist areas and the rest of the town or city. The core or downtown (CBD) is the centre of economic and retail activities. A complementary zone of industry and services is localised at the periphery. Along the arterial roads ways that connect the seaside resort with other towns and cities, B&B (bed and breakfast) hotels are settled. Finally, the zones of suburban residence are placed at the peripheries of the city.

The process of consolidation of the *conventional seaside resort* by Smith (1991) is composed of eight sequential stages: "(1) pre-tourism datum, (2) second homes, (3) first hotel, (4) resort established, (5) business area established, (6) inland hotels, (7) transformation, and (8) the consolidation of the city resort" (Williams, 2009, p. 93) (Figure 86).

Genußmittelindustrie (Entwurf: K. Vorlaufer; Zeichnung: U. Beha)" (Vorlaufer, 1996, p. 166). The legends and the main texts were translated into English and inserted into the original maps by the author.

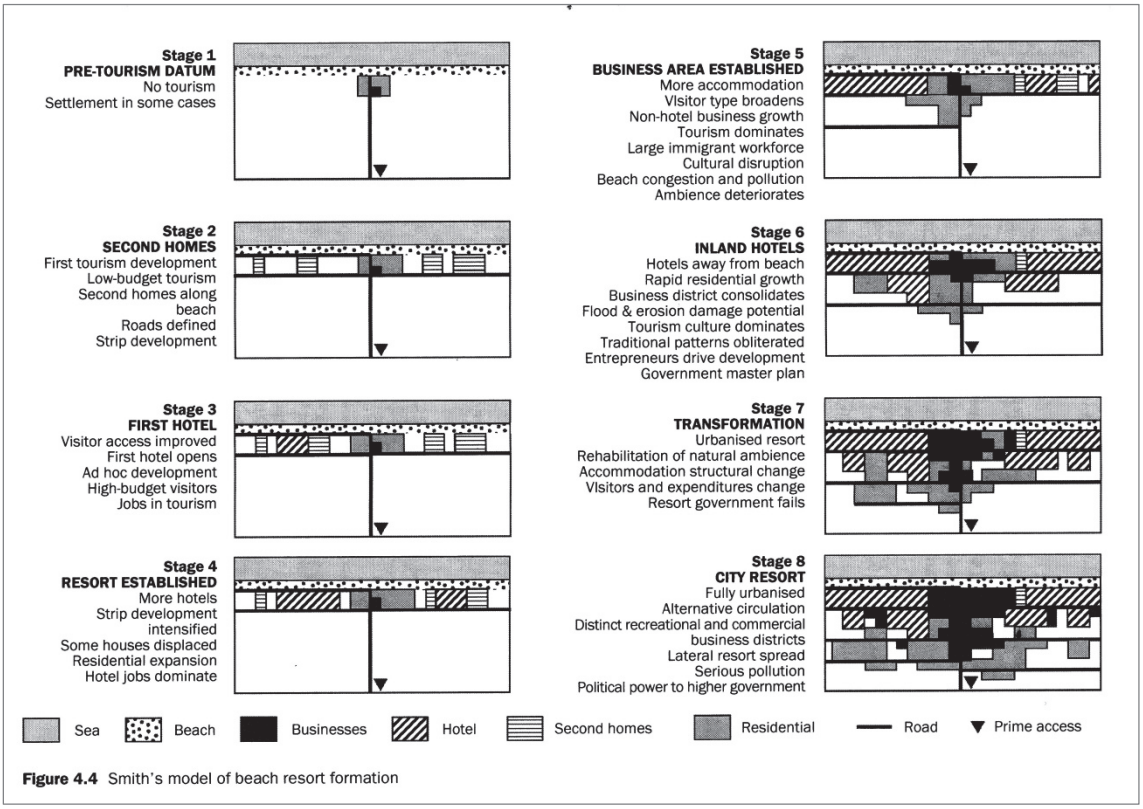


Figure 4.4 Smith's model of beach resort formation

Figure 86: Smith's model of beach resort formation (Source: Smith, 1991 in Williams, 2009, p. 93)

In the case of Puerto Lopez, equivalent stages could be identified from the first arrival of international tourism in the 1990s until today. The socio-economic context, which is characterised by the extreme levels of underdevelopment, poverty and informality, is a determining variable, which shapes the intensity and velocity of the transformations. By comparing the urban growth process of Puerto Lopez over the last two decades and the resulting distribution of the land use with the model of resort formation by Smith (1991) (Figure 86), specific features can be identified. The first, and probably most important, is the level of evolution as a beach resort.

A map with the location of the current land uses by zones allows some first deductions. At present, it can be inferred that Puerto Lopez is experiencing its establishment as a resort, i.e. stage 4 in Smith's model. Hotels and hostels have been erected in the downtown and along the beach, which transformed into the most wanted locations by private investors. This urban pattern is defined as *strip development* and is intensified with the rise of private investments. Two complementary reactions were triggered thereby: (1) the displacement of owners from their original residential zones (by directly buying of their plots) and (2) the formal and informal residential expansion to the north and the east (Figure 87).

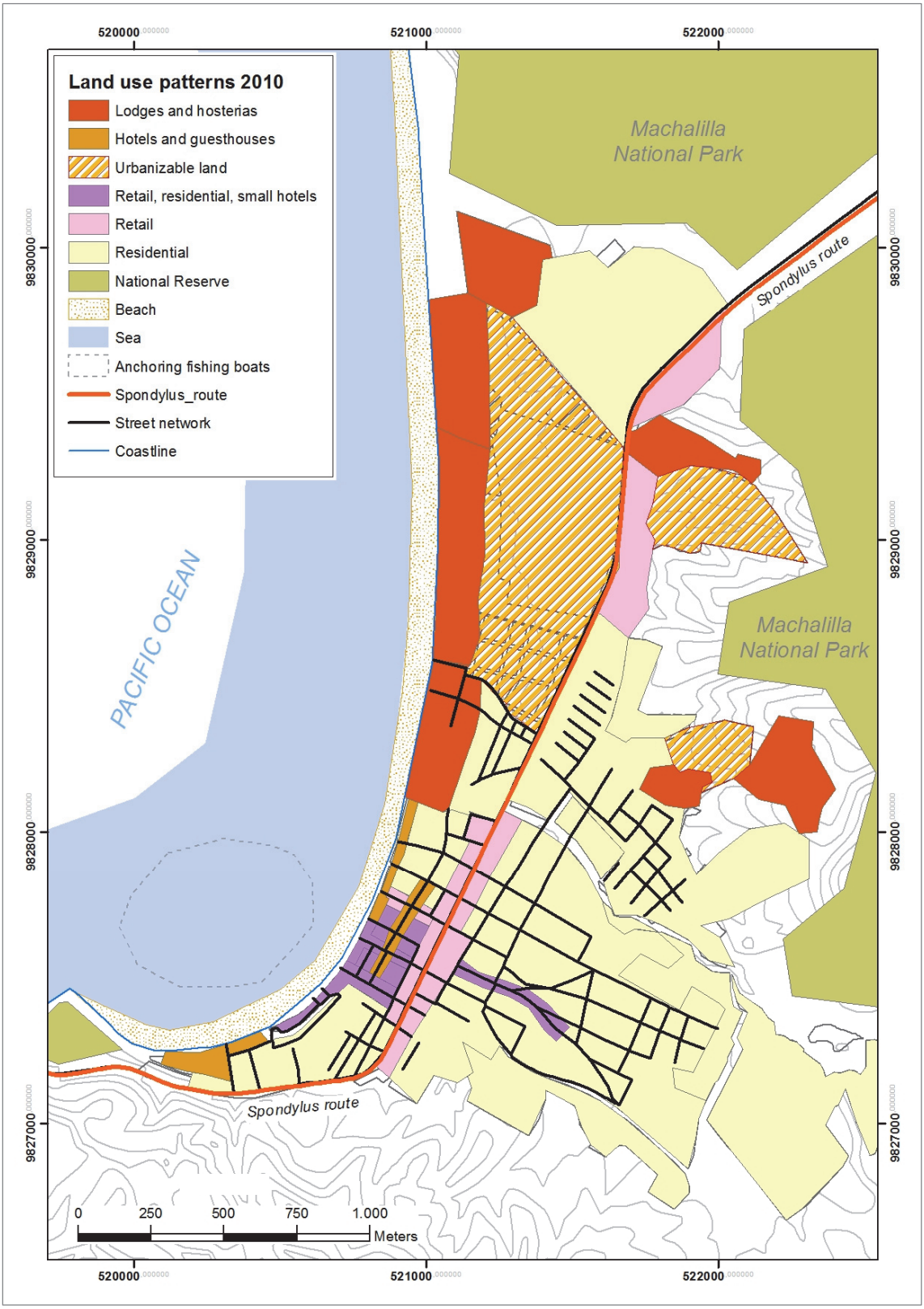


Figure 87: Resort structures and land use patterns in Puerto Lopez (Source: Own draft, 2016)

Downtown (1) is the traditional centre that concentrates mixed land uses (residential and retailing) and the emerging hotels, hostels, guest houses, restaurants, and other types of retailing related to tourism. Specifically, along with the seaside border, the land market elevated the price of the plots due to their location and direct connection to the beach as a valuable landscape. In

addition, the Spondylus Route is the arterial road that connects the town with the rest of the region, contributed to foster the construction of residential and retail buildings.

The beach (2) and the Spondylus road (3), extend parallel from each other, shaping an extended urban area from south to north. Nevertheless, the best macro plots situated along the northern beach (5) have progressively been bought by foreign investors to build new hotels, hostels or bungalows. The areas behind these seaside plots are nowadays the sites of recently built neighbourhoods (4) and second homes for foreign visitors. The informal residential areas (6) extend to the eastern hilly area of Puerto Lopez, which is currently the most intensive hotspot of rapid urban growth. As mentioned above, the majority of the houses have been built here by the families and with traditional construction materials imported from the large cities. This mechanic of urban growth is defined as *progressive housing*.

This means that the dwellings could take several years, even decades until they are totally finished. Due to the lack of legalisation or the low incomes, families adapt the construction process to their priorities of living inside the house and investment capacities. They build what they need as a shelter and home to progress as a family. Subsequently, the house will be improved and expanded horizontally or vertically, depending on the necessities of the occupants. It is also important to observe some physical features of the topography of the site, which have determined the urban growth of Puerto Lopez. This town is settled at the mouth of three dry-season rivers which flow from the hilly eastern valley to the flat borders along the beach. The best lands to be urbanised are localised at the north end of the beach. Surrounding the southern and eastern borders of the town, the topography is rugged, and the quality of the soil is not stable.

Nowadays, Puerto Lopez is expanding rapidly over the eastern hills following the riverbeds to the east. During this dynamic, the national park border is constantly threatened by the formal and informal urban growth. Looking for a more abstract representation to understand the main changes, a first scheme of the Puerto Lopez beach resort formation has been developed. From the first physical connection with the national routes network by the construction of a coastal road and the arrival of the flows of transport buses in 1979 to the self-organization and distribution of the land use in the downtown and peripheries due to the tourism boom experienced in the last two decades, the different stages of tourism resort consolidation simplify the understanding of these new economic dynamics.

The urban growth of Puerto Lopez is mainly oriented to the east and north. The downtown (1) is the core that connects the Spondylus Route (3) with the seaside (2). Along the Spondylus Route (3), the perpendicular streets, which have the role of main entrances and along the beach (2),

residences and retailing, share the buildings. There is also a complementary first periphery or fringe belt (3) that comprises a high percentage of residential land use (Figure 88).

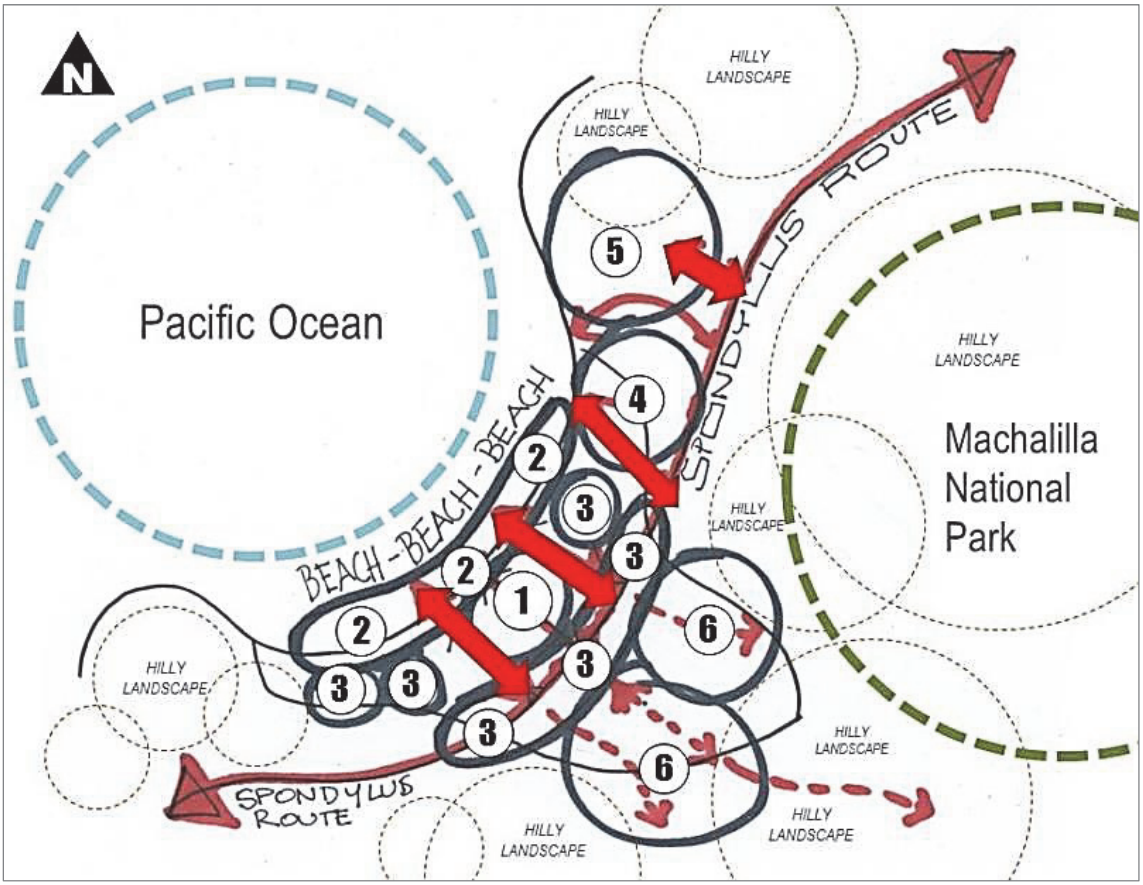


Figure 88: Evolution of the beach resort scheme (Source: Own draft, 2014)

As it has been mentioned above, there is a marked gap between the informal vulnerable east (6) and the profitable residential-tourist north (5). Especially, the increase of social inequality, as a characteristic of the outcomes of globalisation processes in the developing world, expressed itself by the differences in public space quality and exposure to natural disasters.

7. Townscape analysis: new urban forms in Puerto Lopez

Even though the physical changes in Puerto Lopez are observable and measurable on maps and by statistics, there is not a clear and touchable certainty about the sustainability of each type of urban form, and how each of them could be increasing or decreasing the resilience of both the urban settlement and the entire ecosystem (McEwan, Silva, & Hudson, 2011; MAE, 2007). Therefore, a method to evaluate the quality of the urban growth was designed and applied by the author by combining *Townscape analysis* (Conzen, 2004), the *Model of beach resort formation* (Smith, 1991 in Williams, 2009), and GIS tools. The method is composed of six phases: (A-D) Preparing multivariate maps, (E) Overlapping multivariate maps, (F) Demarcating urban forms, (G) Measuring sustainability of urban forms, (H) Drafting scenarios of intervention, and (I) Drafting a scheme of urban growth (Figure 89).

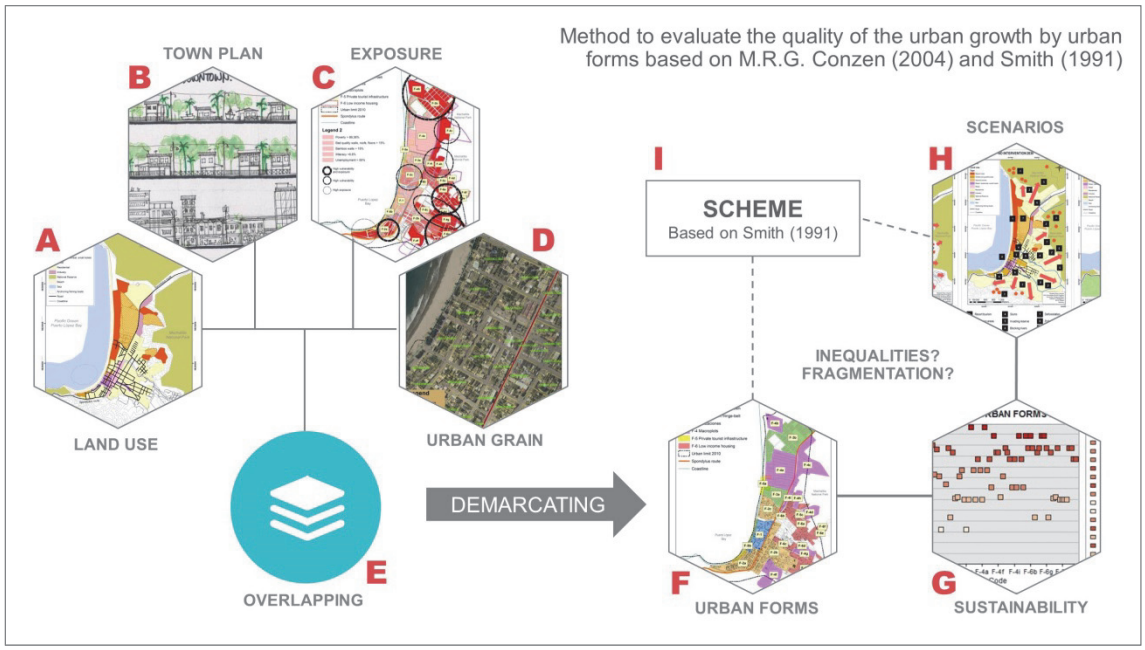


Figure 89: Method to evaluate the quality of the urban growth in Puerto Lopez (Source: Own draft, 2016)

In the first phase (A-D), four main sources of information were prepared and summarized in four multivariate maps: (A) *Land use*, (B) *Townscape*, (C) *Vulnerability and exposure*, and (D) *Urban grain*. The statistical (census data per urban sectors) and geographical (vectorial [shapes] and raster [orthophoto]) information used to create these multivariate maps, corresponded to the year 2010. The Land use and Townscape maps were merged into one multivariate map in order to describe the current (2010) structure, components, and land uses of the settlement, especially related to the main economic activities tourism and fishing. The Vulnerability and exposure multivariate map was created by overlapping statistics per sectors of Puerto Lopez of the year 2010. Critical hotspots of poverty, illiteracy, unemployment, lack of access to basic services, and bad conditions of houses were highlighted. The Urban grain map was drafted by encoding blocks, plots, and building patterns with a *morphocode* created according to the morphological

features of Puerto Lopez. These morphocodes were inserted in the data table of the shape of blocks, and a first map was created to observe the levels of homogeneity or heterogeneity of the urban grain. A range of four levels of fragmentation was identified and demarcated based on the predominance of combinations.

In the second phase (E and F), the four multivariate maps were overlapped to find similarities and differences that allow demarcating urban forms. As a result, six urban forms were identified and demarcated. Likewise, their surface and distribution over the urban area were calculated and mapped. The characterisation, analysis, and graphic representation of each urban form resulted as a sort of "snapshot" of its urban morphology and social content at a given moment (2010).

In the third phase (G), the urban forms were measured and compared regarding sustainability by the use of the indicators of sustainable urban development based on the *Sustainable Development Goals* (SDGs) of the *New Urban Agenda 2015-2030* (NUA). The main outcome of this process is a map with the demarcation of the critical sectors, in terms of vulnerability and exposure to natural disasters, which urgently need to be taken into consideration to improve the quality of the urban growth and the development of the entire urban system.

In the fourth phase (H), two graphic schemes showing the positive and negative scenarios of urban growth of Puerto Lopez were drafted. The current urban forms of Puerto Lopez are the social and physical outcomes of the new urban lifestyles triggered by tourism as a potent economic activity. Social and spatial transformations like in larger cities (fragmentation -poor and rich patches- and social inequalities in the access to essential services and quality of space) were observed in the urban grain of Puerto Lopez.

In the fifth and last phase (I), a scheme to graphically represent the urban growth and socio-spatial transformation of Puerto Lopez was drafted based on the *Model of tourist resort formation from Smith* (1991). Like this model, this scheme is an attempt to visualize the transformation of a fishing town into a tourist destination for a period of time. Nevertheless, it is necessary to remark that it is not a model. It is a specific graphic representation of the case study of Puerto Lopez that was constructed by combining townscape analysis, GIS, and the available sources of statistical and geographical information.

7.1. Identification of urban forms: the urban grain of Puerto Lopez in 2010

The first step to identify the urban forms was to define the particular *urban grains* or urban patterns that predominate in the urban area of Puerto Lopez in 2010. By overlapping georeferenced vectorial information and a 2010 orthophoto, blocks, and plots were mapped and encoded. The principal elements selected to define the urban grain were: (1) *street-block*[38] *pattern*, (2) *plot pattern*, and (3) *building pattern*. From each of these elements, features were identified regarding shape, surface, porosity, construction area, and distribution. These three elements are related to each other in a *hierarchy of containment* (Conzen, 2004), in which "the building pattern is contained within the plot pattern, which is itself contained within the street block pattern" (Kropf, 2014, p. 44) (Figure 90).

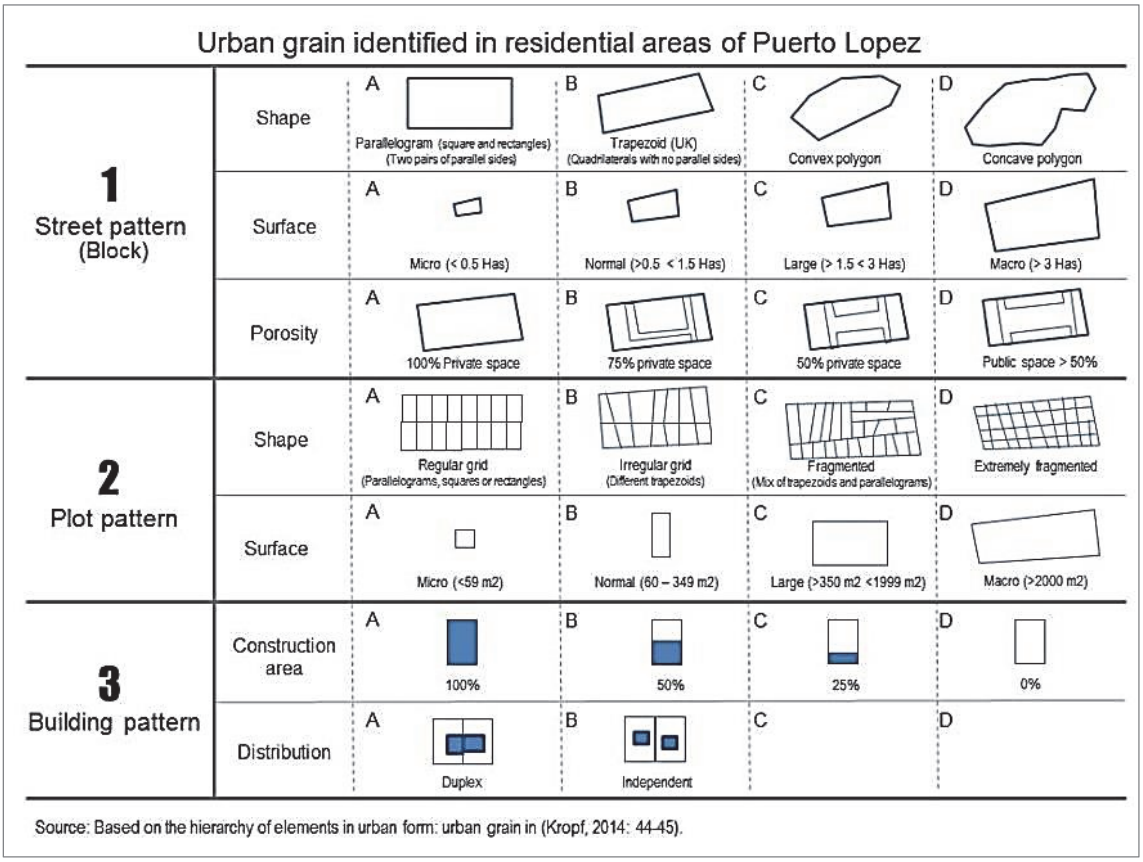


Figure 90: Urban grain of Puerto Lopez 2010 (Own draft based on Kropf, 2014, p. 45)

The combination of features generates a code of patterns or *morphocode*, which allows describing and classifying the urban grains. The first element, street pattern or block, is the great container of items and is shaped by three main features: (A) shape, (B) surface, and (C) porosity (percentage of private and public space). The second element, plot pattern, has the features (A) shape and (B) surface. Finally, the third element, building pattern, was defined by the features (A) construction area and (B) distribution of the building inside the plot. For example, the urban

[38] Blocks and streets are considered as the same in terms of shapers of the urban form that contents plots and buildings. The street network shapes the urban grid and consequently the blocks inside it (Kropf, 2014).

grain that predominates in the blocks of the downtown of Puerto Lopez could be described by the following morphocode:

1(A+B+A) + 2(C+B) + 3(B+A)

1. Street/Block pattern: **(A)** Parallelogram + **(B)** Size normal > 0.5 ha < 1.5 ha + **(A)** 100% private space.
2. Plot pattern: **(C)** Fragmented + **(B)** Normal plot.
3. Building pattern: **(B)** 50% of construction area + **(A)** Row housing.

The urban grain of Puerto Lopez is predominantly fragmented due to the process of parcelling or subdivision of plots. Between 2009 and 2012, around 900 new plots were created as a consequence of the subdivision of parcels or larger plots (Figure 91).

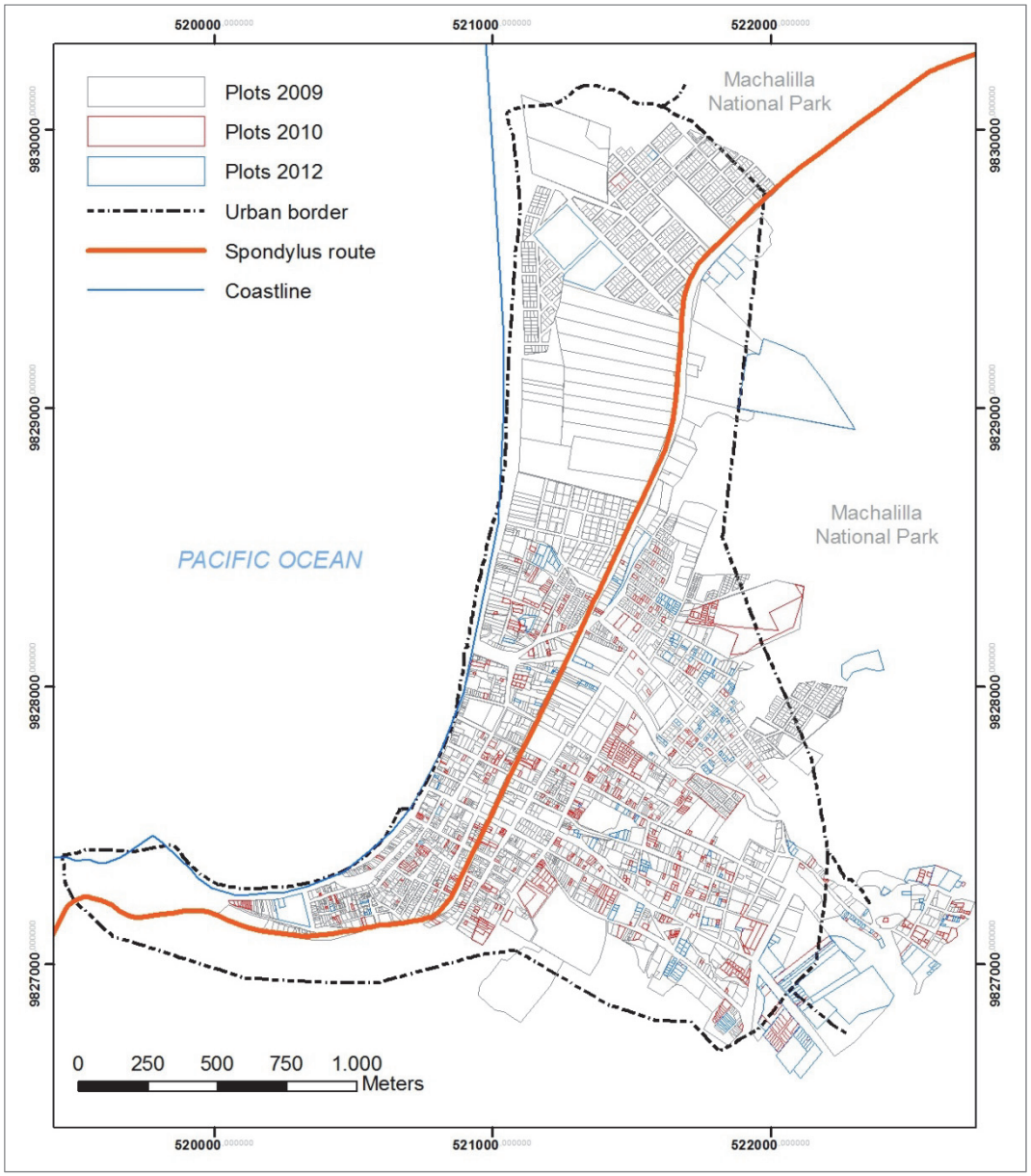


Figure 91: Parcelling of plots between 2009 and 2012. Source: GAD Puerto Lopez, 2012

In 2010, the urban area of Puerto Lopez was shaped by 290 blocks and around 4,500 plots which represented a surface of 260.02 hectares. By combining block, plot, and basic building patterns, 127 types of urban grains have been identified and encoded (Figure 92).

Figure 92: Mapping urban grain and assignation of a morphocode (Source: Own draft, 2016)

The urban grain of Puerto Lopez is extremely diverse and dispersed in the western flat areas as well as in the hilly eastern periphery. Symmetric and orthogonal grids were only identified in the new expansion areas of the northern peripheries (Figure 93).

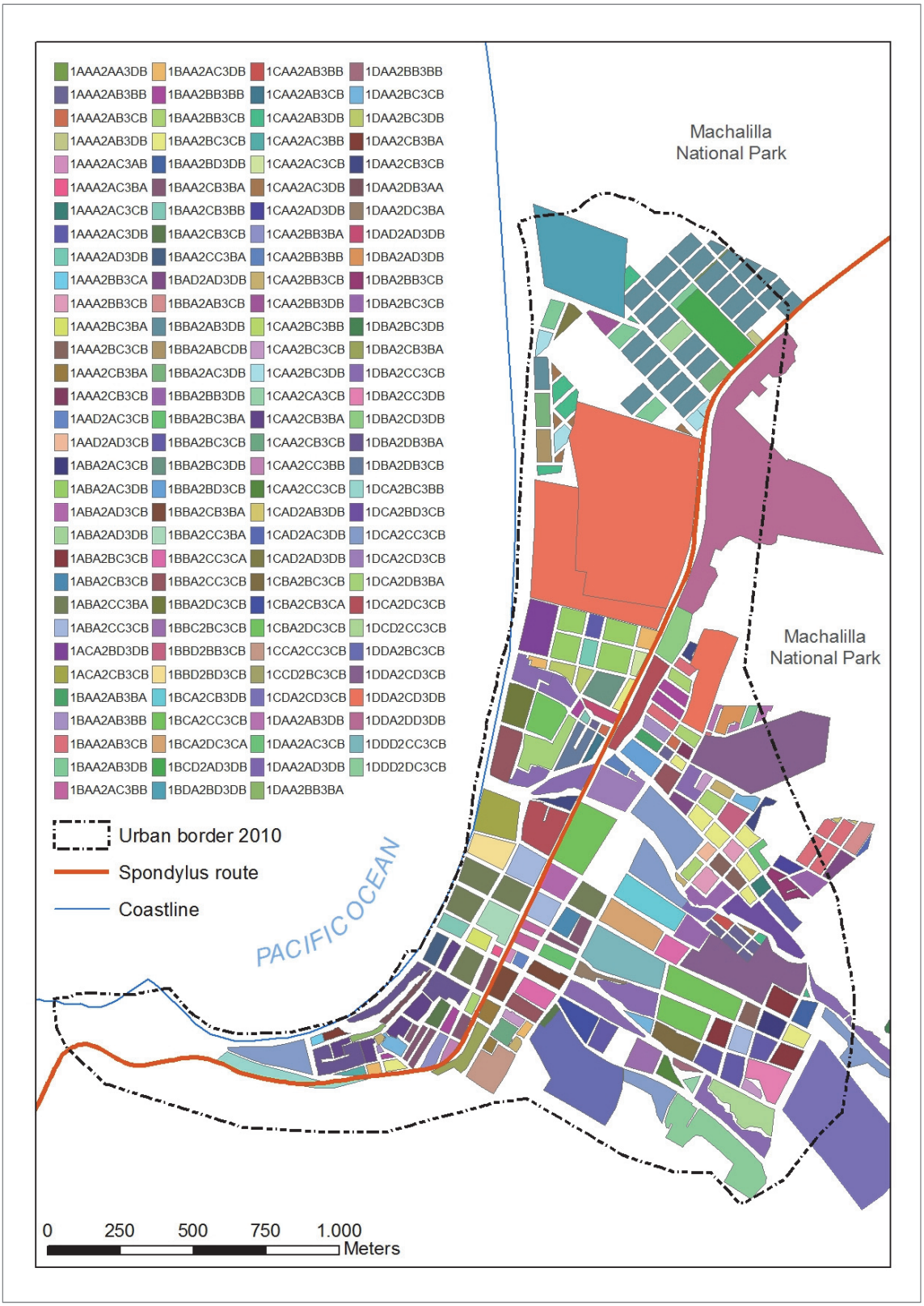


Figure 93: Heterogeneity of the urban grain per blocks (Source: Own draft, 2016)

Subsequently, these urban grains were grouped into four types by the similarities in the shapes of the blocks (parallelogram, trapezoidal, convex polygon, and concave polygon) and the plots (symmetric, irregular, fragmented, and extremely fragmented). The 127 combinations of codes were reduced to 16 divided into four levels of fragmentation: low, medium, high, and extreme (Table 22).

Basic pattern	Code	Feature		Morphocode	Fragmentation
1 Block/street Shape	1A	Parallelogram		1A2A	Low
				1A2B	Low
	1B	Trapezoidal		1A2C	Medium
				1A2D	Medium
	1C	Convex polygon		1B2A	Low
				1B2B	Low
	1D	Concave polygon		1B2C	Medium
				1B2D	Medium
2 Plot grid Shape	2A	Symmetric grid		1C2A	High
				1C2B	High
	2B	Irregular grid		1C2C	Extreme
				1C2D	Extreme
	2C	Fragmented grid		1D2A	High
				1D2B	High
	2D	Extremely fragmented grid		1D2C	Extreme
				1D2D	Extreme

Table 22: Classification of blocks and plot grids by fragmentation (Source: Own draft, 2016)

The old downtown and its immediate fringe belt concentrate the majority of medium fragmented blocks, while the northern and eastern peripheries contain the most fragmented. In the case of the downtown and fringe belt, the fragmentation is the outcome of the informal parcelling and subdivision of large terrains for selling or distributing within the families. On the peripheries, the level of fragmentation increases. Despite the fact that the topography directly influences the levels of irregularity of the urban forms, especially in the eastern hilly areas, there is also an extreme fragmentation of plots in blocks and macro blocks.

On the other hand, the most regular and symmetric grids correspond to the new (2001-2010) social housing project built in the northern flat periphery (zone 1 – sector 1), and to the eastern lotizaciones, which had been macro plots formally parcelled by the local owners in order be sold. The majority of them are not occupied, and their surrounded streets are still not asphalted (Figure 94).

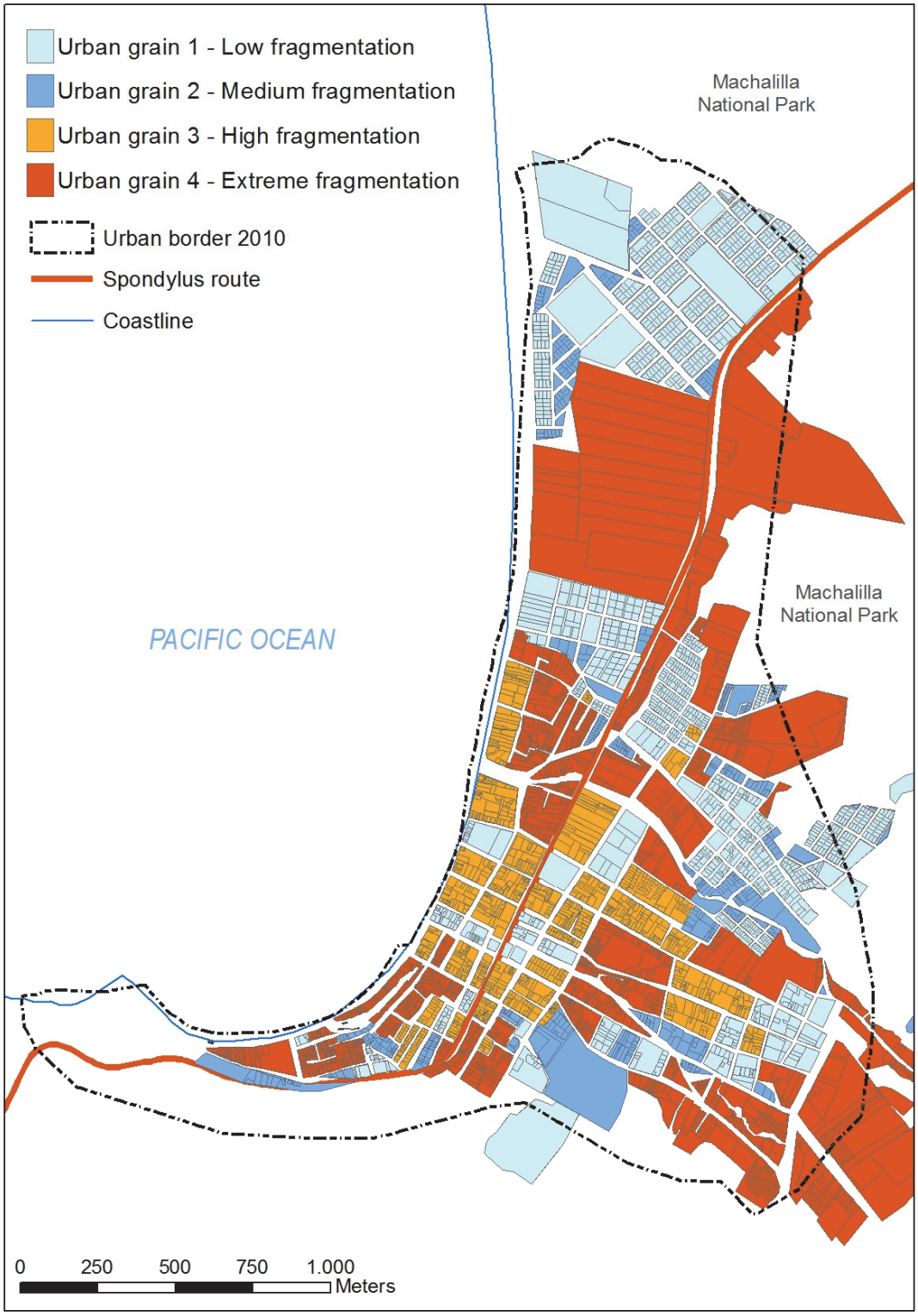


Figure 94: Urban grain by block and plot patterns 2010 (Source: Own draft, 2016)

Urban grain Fragmentation	Main codes combined (Block form + Plot form)	Number of blocks	Surface (Ha)	Percentage of surface
1 – Low	1A2A, 1B2A, 1A2B, 1B2B	128	65.16	25.06%
2 – Medium	1C2A, 1C2B, 1D2A, 1D2B	62	27.62	10.62%
3 – High	1A2C, 1A2D, 1B2C, 1B2D	38	31.24	12.02%
4 - Extreme	1C2C, 1C2D, 1D2C, 1D2D	56	136	52.30%
Total	**15 codes**	**284**	**260.02**	**100%**

Table 23: Main features of the four types of urban grains mapped (Source: Own draft, 2016)

The urban grain of each block inside the urban area has been encoded to find similarities. The predominance of codes in a group of blocks defined the urban grain. This information was inserted in the geodatabase as a GIS shape of polygons and transformed into a map. Finally, these shapes of urban grains were overlapped with the shapes of the Vulnerability and exposure and the Land use and townscape multivariate maps (Figure 95).

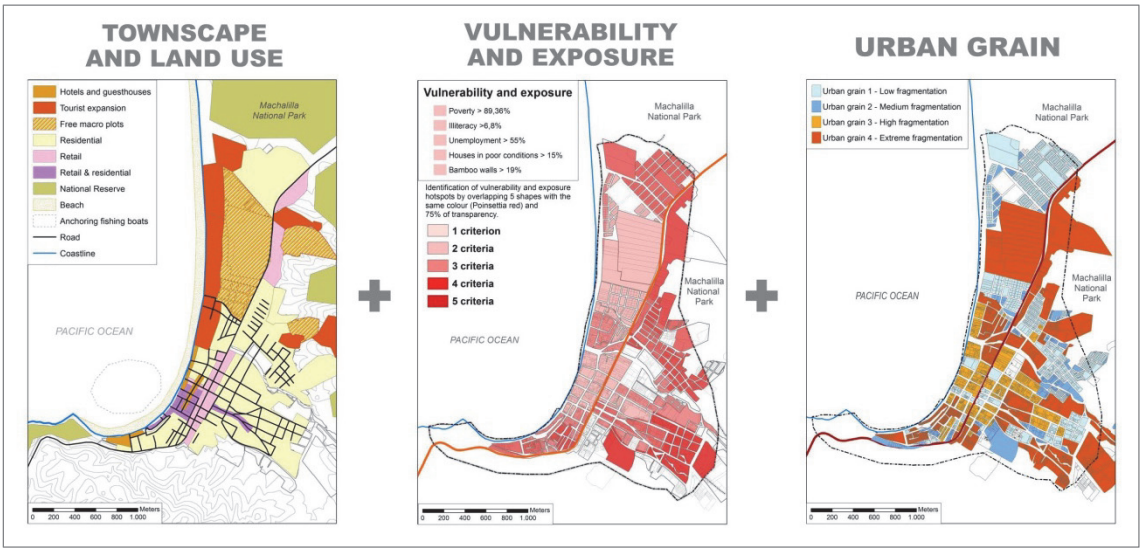


Figure 95: Overlapping of maps 2010 (Source: Own draft, 2017)

The resulting combination of features allowed making a first basic demarcation of the main urban forms that shaped Puerto Lopez in 2010. Due to the complexity of the urban area, it was impossible to sketch clear limits between urban sectors due to the multiple types of similarities and diversities in the built and social spaces. That is the reason why the delimitation of the new urban forms was based on the predominance of similarities concentrated in sectors where the increase of tourism triggered changes in land use and urban growth.

In total, six urban forms have been identified and delimitated by different colours. They characterise the urban growth of Puerto Lopez between 1990 and 2010.

- F-1 Parcelling and densification in downtown.
- F-2 Densification in the fringe belt.
- F-3 Formal social housing and *lotizaciones*.
- F-4 Macro plots and gated communities.
- F-5 Private tourist infrastructure.
- F-6 Informal low income housing.

These urban forms were classified by the three criterions: (1) similarity between the forms and components (block, plot and building), (2) homogeneity/heterogeneity of the socio-economic content, and (3) patterns of urban growth (location, topography, and land use). Dispersion and concentration are the two main patterns of expansion.

On the one hand, the majority of the urban forms are spread across several sectors inside, and even outside, the urban limit of Puerto Lopez in 2010. Particularly, this dynamic can be observed in the peripheral expansion areas that collide with the Machalilla national park. Some of the new macro blocks and plots (F-4) have penetrated into the natural reserve. Likewise, low income settlements (F-6) and formal housing projects or lotizaciones (F-3) extended their surface without considering the official urban border or occupying risk areas.

The private tourist infrastructure (F-5) is a particular type of urban form due to its nature of reproduction and location inside and outside the urban space. It has scattered as polygons in diverse places across the city and in the natural landscape. This particular feature made it impossible to be grouped by blocks or sectors. However, its importance as the driver of social and spatial transformation in neighbourhoods, streets, and natural landscape turned it into an essential "atomised" urban form to be included.

On the other hand, there is only one urban form gathered in one specific area: the densification of the downtown (F-1). It has become the main core of tourism, civic, and commercial activities in Puerto Lopez, as well as the main hotspot of urbanisation for the last two decades. By using the physics of an "explosion" as an analogy to explain its role, the transformation of downtown in Puerto Lopez has been the "ignition place" where the primary energy was set free, and from where it expanded to the surfaces physically available to be urbanised. From a gathered core and fringe-belt the wave of rapid and uncontrolled urbanisation expanded in forms of fragmented pieces in the periphery, and even overpassing the urban limits and invading the preserved natural landscape (Figure 96).

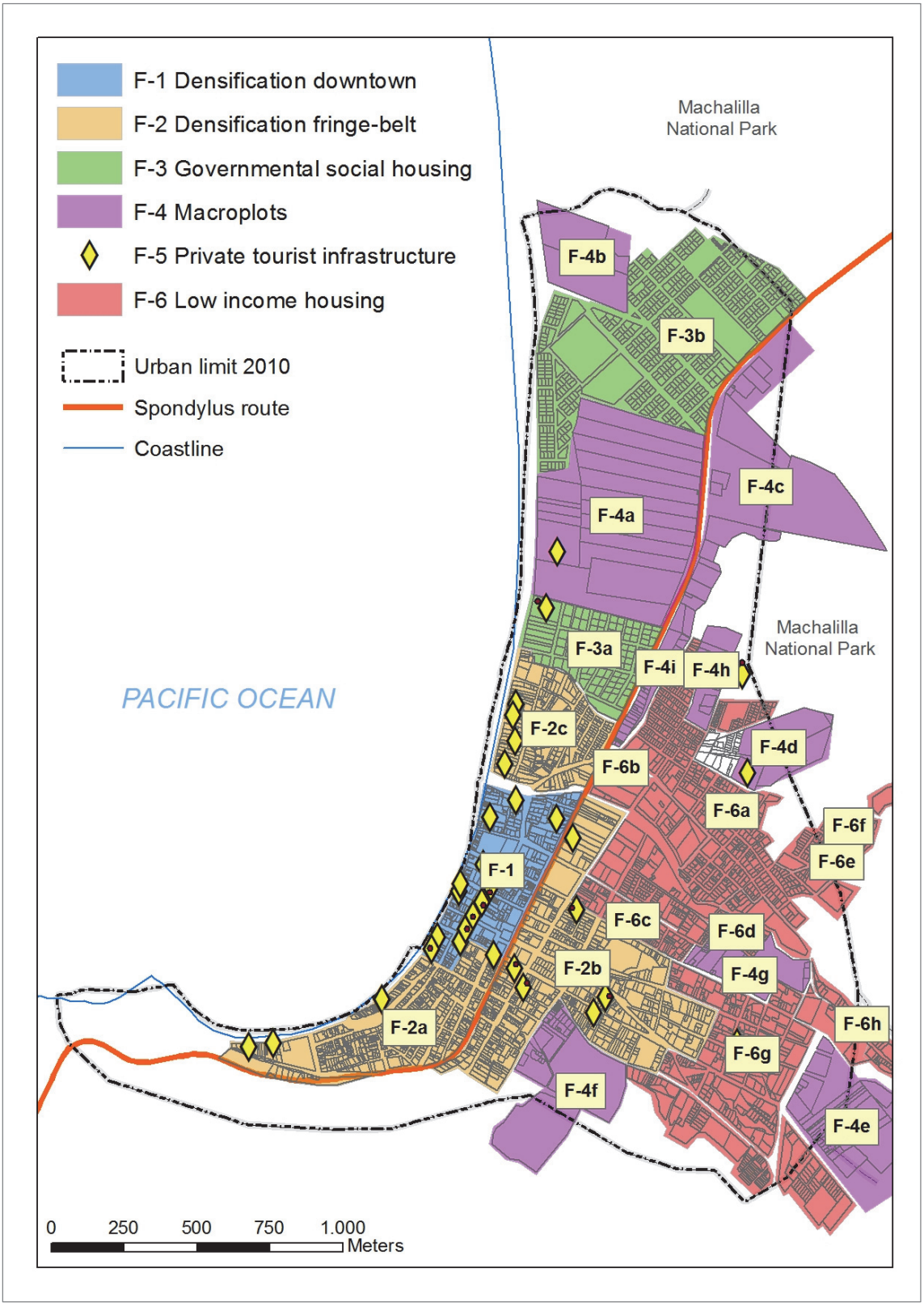


Figure 96: Urban forms in Puerto Lopez (Source: Own draft, 2016)

The sum of polygons that shape each urban form was mapped, encoded, and included in the geodatabase as a GIS shape. It allowed calculating with precision the surface and location of each urban form to define the percentage of the occupied urban surface. Particularly, the

physical predominance and fragmentation of the peripheral urban forms (F-4 and F-6) became visible (Table 24).

Urban form	Code	Surface (ha)	Percentage
F-1 Densification downtown	F-1a	**16.75**	**5.12%**
F-2 Densification fringe-belt	F-2a	**69.91**	**21.35%**
	F-2b		
	F-2c		
F-3 Social housing and lotizaciones	F-3a	**48.86**	**14.92%**
	F-3b		
F-4 Macro plots	F-4a	**113.51**	**34.67%**
	F-4b		
	F-4c		
	F-4d		
	F-4e		
	F-4f		
	F-4g		
	F-4h		
	F-4i		
F-5 Private tourist infrastructure	F-5a	**11.70**	**3.57%**
	F-5b		
	F-5c		
	F-5d		
F-6 Low income housing	F-6a	**66.67**	**20.36%**
	F-6b		
	F-6c		
	F-6d		
	F-6e		
	F-6f		
	F-6g		
	F-6h		
Total		**327.40**	**100%**

Table 24: Urban forms 2010: surfaces (Source: Own draft, 2016)

7.1.1. Parcelling and densification in downtown (F-1)

In 2010, this urban form has a surface of 16.75 hectares (5.12% of the urban area) and 1,604 inhabitants. It is shaped by the flat downtown located at the foot of the beach (Figure 97).

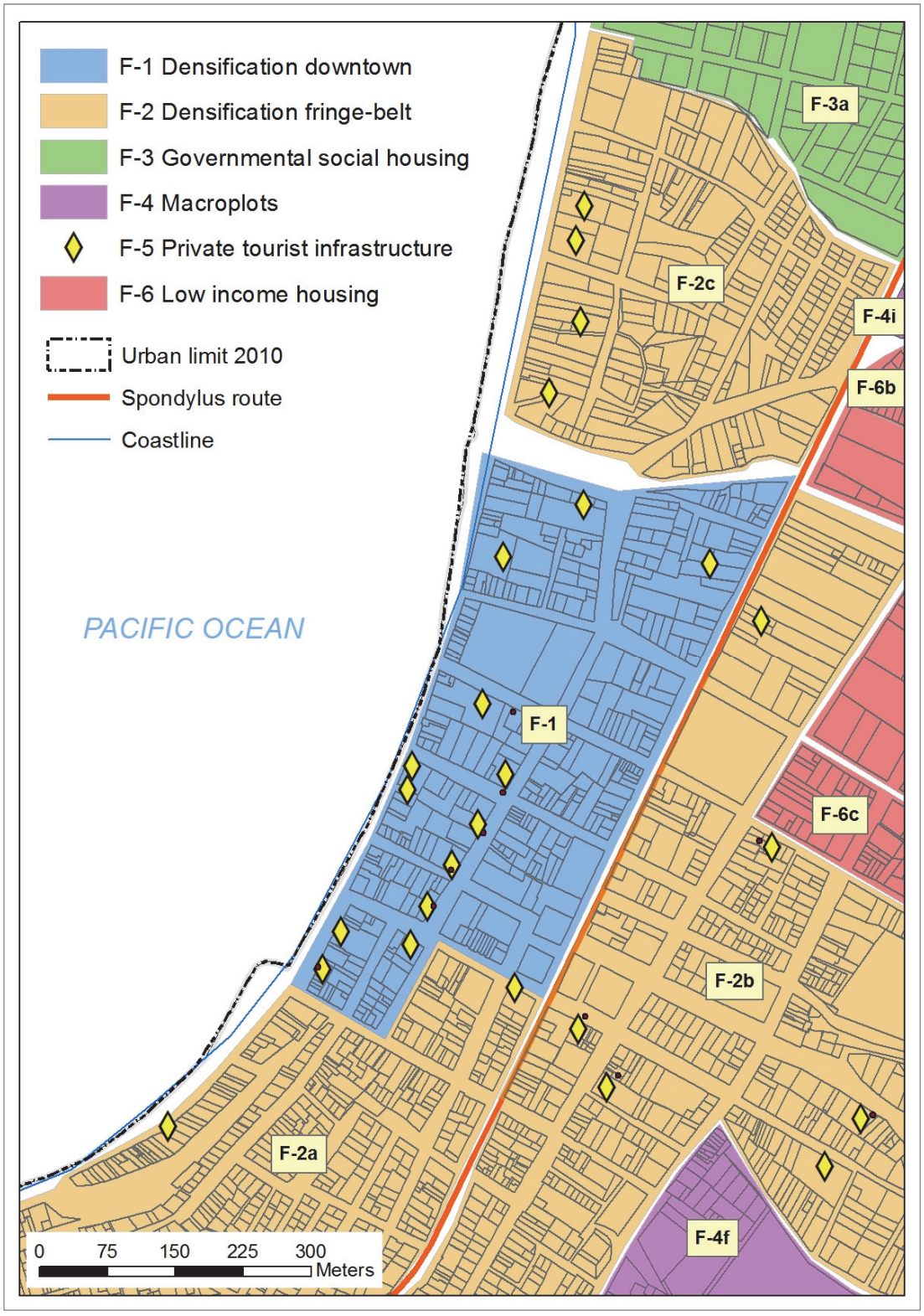


Figure 97: Location F-1 (Source: Own draft, 2016)

The first process of transformation began in the downtown or urban centre, which usually is the most consolidated built space inside coastal villages and towns like Puerto Lopez. As it has been described in its evolution, Puerto Lopez was not a colonial-founded settlement. Its original or pre-tourism urban morphology was not the result of a strategic urban planning process. It was a fishing village that grew spontaneously by the gradual settling of families who have worked on artisanal fishing and agriculture for many decades (Harris et al., 2004).

Predominant morphocode	1ABA-2CB-3BA Low and medium fragmented
Location	Downtown, between Spondylus route and the beach
Topography	Predominantly flat
Population density	Medium: 46-66 inhabitants per hectare
Land use	Mixed: residential and retailing (tourist services)
Access to basic services	Regular: 60%-80% water, 0% sewage,92% electricity
Quality of buildings	Regular: 14%-15% of houses with walls in bad conditions
Exposure	High: High-tides, tsunamis, earthquakes, and floods

Figure 98: Urban grain F-1 (Source: Own draft, 2016)

Nevertheless, over decades this urban area has been identified as the downtown or core of Puerto Lopez by inhabitants and visitors, due to its concentration of the main commercial, civic, religious, and social activities. By converting Puerto Lopez into a tourist town, this role as small

commercial downtown has been fortified (Pozo, et al., 2014). The predominant urban grain is mainly shaped by trapezoidal and rectangular blocks with an average surface between 0.5 and 1.5 hectares.

Despite been settled on a flat area, the plots grid is fragmented due to the first irregular demarcation of plots and the consequent subdivision or parcelling of them since the appreciation of this area has increased. However, the surface of the plots is still relatively large if compared to downtowns in other cities. The average surface of plots in the downtown is between 150 and 1,200 square meters. In the majority of them, more than the 50% of the surface is covered by buildings (Figure 99).

The hierarchy of the street network has been orientated to the two largest concentrations of commercial and leisure activities: the Spondylus Route and the beach. Along these two parallel strips, the urban growth boiled with more intensity. The downtown was trapped between these parallels and experienced rapid processes of spatial transformations, particularly along the secondary streets connecting these parallels. Another important feature of downtowns in coastal towns like Puerto Lopez, is their risk topographical exposure to natural disasters. The urban core of Puerto Lopez settles over a flat land directly connected to the coastline, which is also part of an estuary of summer-rivers and natural gorges. Both collect and drain off rainwaters from the steep landscape (Machalilla National Park). For inhabitants and their built environment, this feature means an extreme exposure to high tides, tsunamis, marine storms, floods, landslides, and strong river currents.

Contrary to the traditional ways of life of pre-Hispanic tribes, which probably would not consider this location as the best place for settling, it was the first built space to increase its land value due to its functional role as a connector between the Spondylus Route and the beach. Plots and buildings of this area experienced a rapid appreciation, particularly those localised along the beach, the Spondylus Route and the main commercial streets. The rise of land value in downtown triggered the emerging of a new informal housing market, whose dynamic was impossible to address by the weak urban planning and informality. The main outcomes were the parcelling of the plots, the increase of mixed land uses (residential and retail), and the rise of population density.

Figure 99: Predominant morphocode F-1 (Source: Own draft, 2016)

The increase of tourist activities attracted the attention of local families and plot owners as a possibility to improve their regular incomes, mostly based on the artisanal fishing and agriculture. Some natives decided to sell all or parts of their plots to tourist investors. Other owners divided them into several pieces to diversify functions and activities. These changes of the internal use of plots and their parcelling in several irregular shapes by old and new owners produced an intensive process of internal spatial fragmentation and vertical growth inside the

blocks. The most important were the following: increase of population density, increase of low-quality self-constructed vertical growth, decrease of green areas, rise of the built space, saturation of basic services, disorder of the land use mixture, increase of informal economic activities related to tourism, increase of traffic, destruction of archaeological remains, soil pollution by latrines, and increase of exposure to natural disasters (Figure 100).

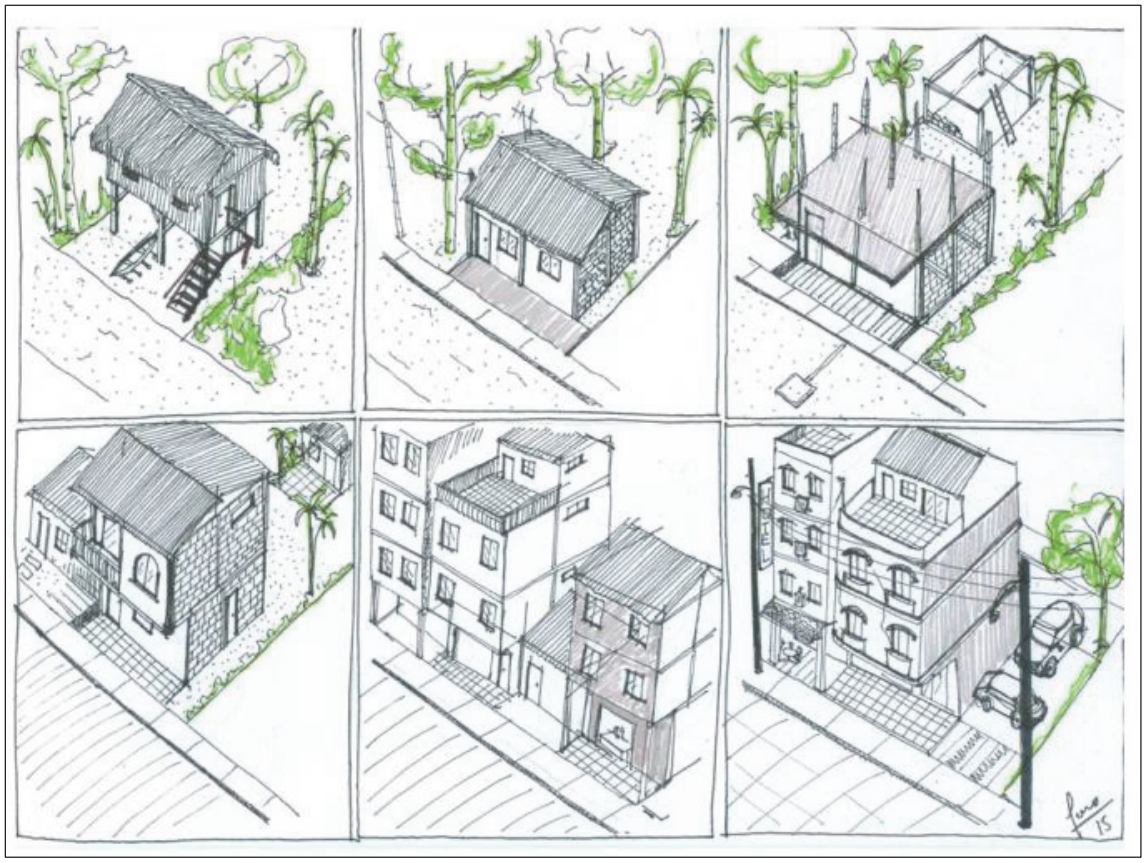


Figure 100: Transformation of buildings in the downtown (Source: Own draft, 2015)

Likewise, a process of social fragmentation has been triggered. The traditional rural ways of life in coastal villages was surpassed by a new modern economic culture. Many of native fishers and farmers decided to be part of the dynamic development by participating in the formal and informal labour market related directly or indirectly to tourism. The actual precarious socio-economic situation in rural areas contributed to foster the idea of a international tourism being the best way to achieve rapid progress. Nevertheless, the social inequality rose, and the majority of the profits were retained by the most powerful local actors, who had the capacity to invest in the best private tourism services and infrastructure. This dichotomous development can be observed by the different types of urban forms and architectural types that offer tourism services in the downtown.

The foreign investors bought plots at the best places (along with the beach) and built hotels, hostels, and bungalows with high standards focused on international tourism (Figure 101). Low income families transformed their houses and plots into informal hostels and guest houses to

catch something of the tourist demand. The lack of capital of the latter forced them to self-construct their hostels and retails in deficient construction quality and without any insurance, which increased the levels of exposure to the above mentioned natural disasters (Figure 102).

Figure 101: Hotel Humpback in Puerto Lopez downtown (Photo: Pozo, 2015)

Figure 102: Houses and retail in the downtown (Photo: Pozo, 2015)

7.1.2. Densification at the fringe belt (F-2)

Complementary to the parcelling of the downtown, a residential fringe belt has been shaped. It is composed of the three sectors: F-2a (south), F-2b (north), and F-2c (east). In 2010, the F-2 urban form had done around 4,300 inhabitants on an area of 69.91 hectares (Figure 103).

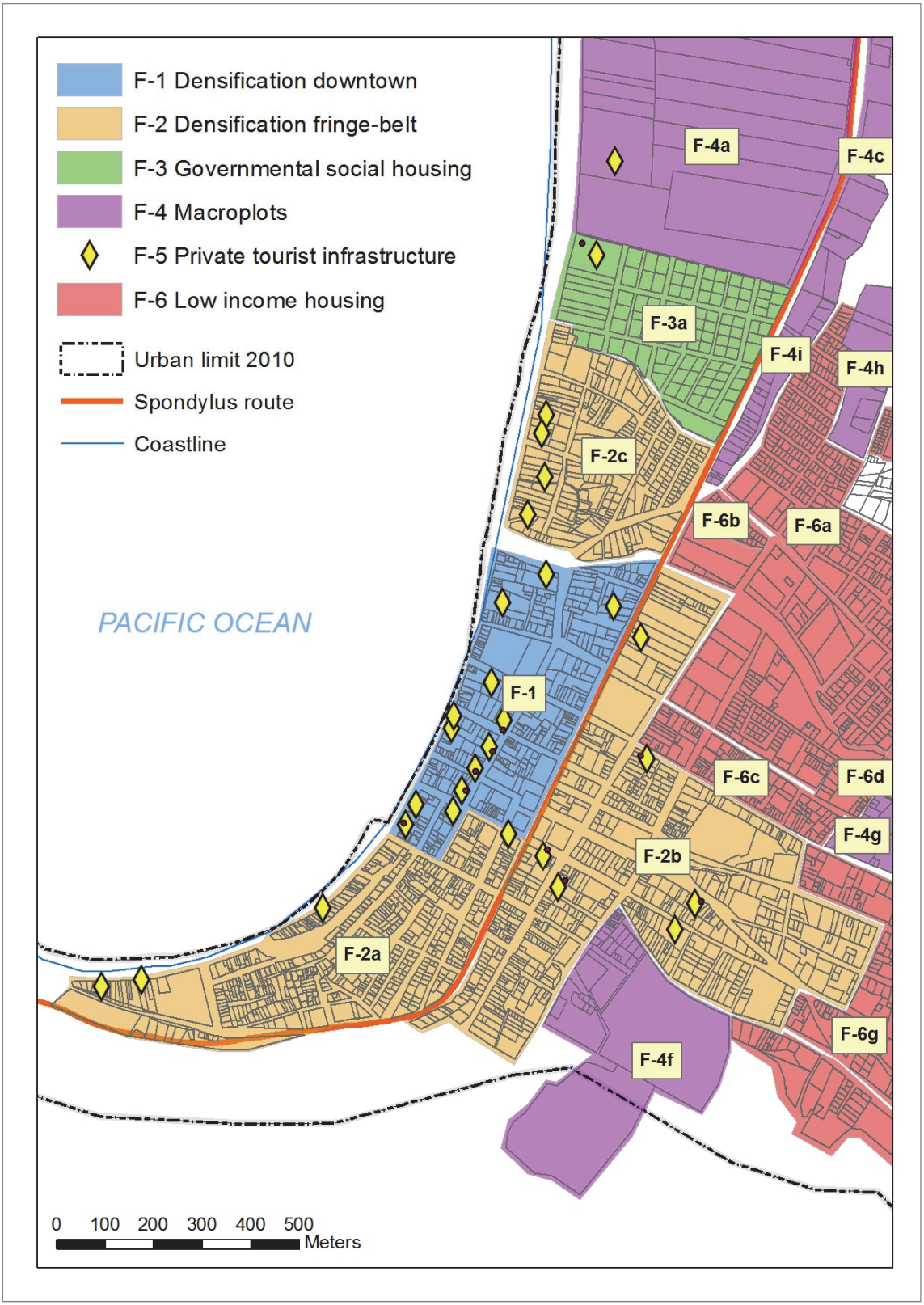


Figure 103: Location F-2 (Source: Own draft, 2016)

The majority of its surface is occupied by residential areas and to a lesser extent by retail units along the Spondylus Route and main streets. The hilly southern F-2a sector or *La Ensenada* is located where the original fishing town had been founded almost three centuries ago, and it has also been the location of the native fishing community. On the contrary, the flat F-2b and F-2c sectors have mostly been settled since 1990 and complete the economic dynamic of the downtown which they encircle.

Predominant morphocode	1DCB-2DC-3BA High and extreme fragmented
Location	Fringe-belt (F-2a) "La Ensenada"
Topography	Hilly
Population density	High: 67-176 inhabitants per hectare
Land use	Residential + informal and formal accomodation
Access to basic services	Bad: 8%-50% water, 0% sewage,91%-94% electricity
Quality of buildings	Bad: 14%-27% of houses with walls in bad conditions
Exposure	High: Landslides

Figure 104: Urban grain F-2 (Source: Own draft, 2016)

The urban grain that predominates is extremely fragmented, with irregular forms of blocks and plots, in part due to the intensive process of densification and parcelling experienced since the

increase of tourism. Disregarding the fact, that the original grids of blocks and plots have already been fragmented due to the topography and the initial informal delimitation of parcels in the rural settlement, the new demand for affordable land triggered the subdivision into plots of a huge diversity regarding forms and sizes. The new owners and local actors were the new generations of natives and newly arrived families as a result of the rural-urban migration, and externals investing in retailing and tourism services (Figure 105).

Figure 105: Predominant morphocode F-2 (Source: Own draft, 2016)

However, the quality of the built space did not experience deep improvements. The use of construction materials imported from large cities shaped its urban image. The same houses made of cement bricks and concrete structures were replicated, but the majority of them with a deficient quality due to the informality of their construction (Figure 106 and Figure 107).

Figure 106: Houses settled in the hilly southern areas (Photo: Pozo, 2015)

Figure 107: Old houses located in the northern fringe belt (Photo: Pozo, 2015)

7.1.3. Governmental social housing and lotizaciones (F-3)

Social housing and lotizaciones are also part of the urban landscape in Puerto Lopez. In 2010, this urban form comprised 48.86 hectares i.e. 14.92% of the total urban surface. It is shaped by the two sectors F-3a and F-3b in the northern area (Figure 108).

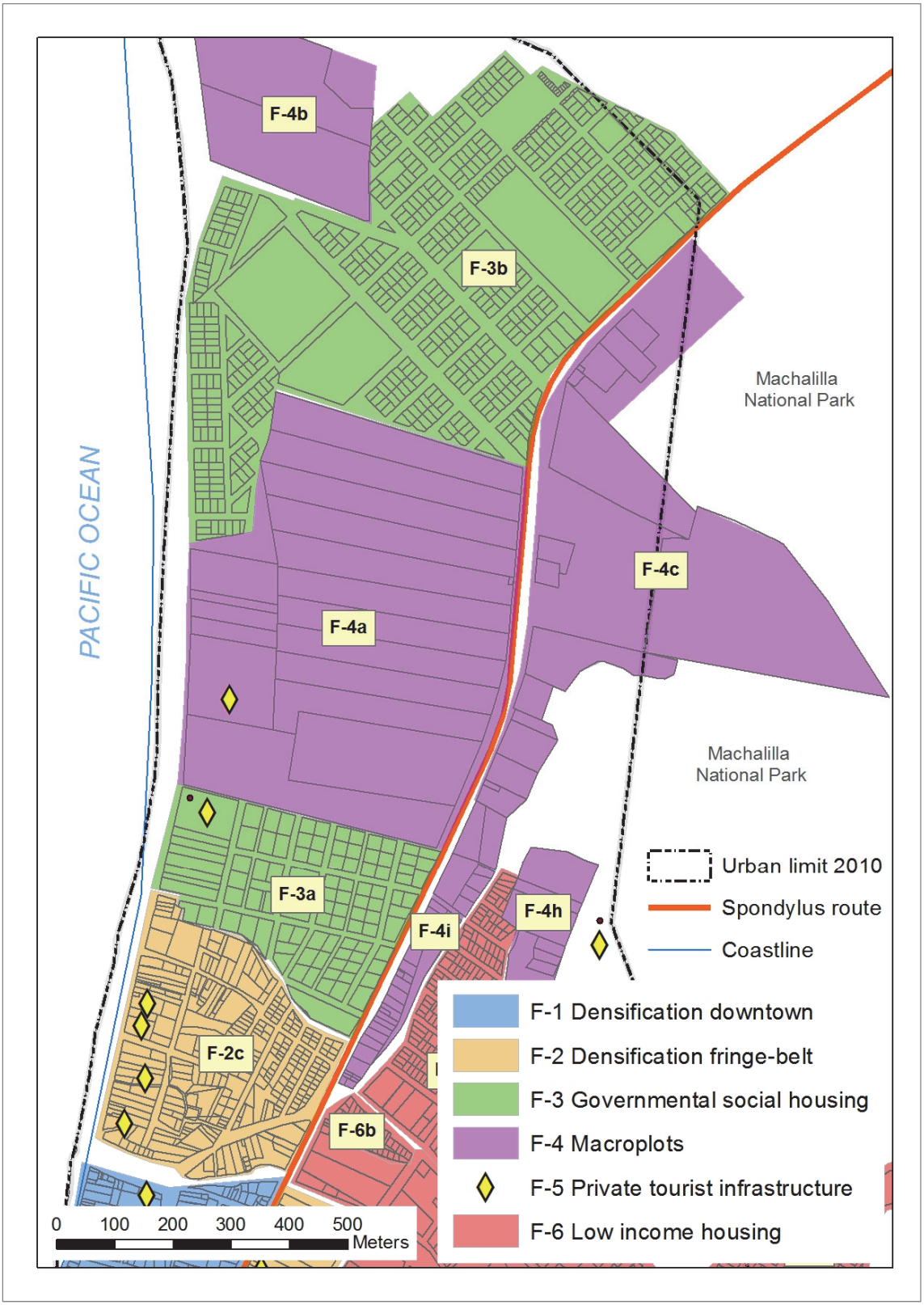


Figure 108: Location F-3 (Source: Own draft, 2016)

As one of the new peripheral expansion areas formally constructed in the last decade, it was still less populated with around 500 inhabitants. The increase of families living in informal housing localised in dangerous areas (liable to flooding land and slopes) and the emergency to relocate them to safe places, prompted the reaction of the local and national governments. The first provided a legalised place in the north of the town, and the latter built a social housing project. Governmental social housing has been identified as a new urban form, which also contributed to the urban growth of Puerto Lopez (Figure 109).

Predominant morphocode	1ABA-2AB-3BA Regular, symmetric, and low fragmented
Location	Northern periphery, "Los Alamos"
Topography	Predominantly flat
Population density	Low: 6 - 22 inhabitants per hectare
Land use	Residential
Access to basic services	Bad: 8% water, 0% sewage, 80%-84% electricity
Quality of buildings	Bad: 12%-17% of houses with walls in bad conditions
Exposure	High: High-tides, tsunamis, and floods

Figure 109: Urban grain F-3 (Source: Own draft, 2016)

The urban grain is predominantly shaped by regular grids of rectangular blocks and plots. The majority of them are symmetric and adapted to the flat topography. The average size of the plots is between 350 and 1,000 square meters (Figure 110).

Figure 110: Predominant morphocode F-3 (Source: Own draft, 2016)

Even though the aim of social housing is to provide affordable houses to lowincome families, in this case, the quality of the built space is not the best. The first point is related to the quality and efficiency of the architectural design, functionality, construction materials, and energy consumption of these standardised houses. The architectural design of these houses is a model

used commonly in the tropical climate, but without considering optimised energy efficiency and the comfort of the families. They are literally “concrete boxes” of 36 square meters, which were built with contemporary construction materials like cement bricks, reinforced concrete structure, and asbestos roof (or even zinc roof). This model of public housing has not experienced any significant innovation in the coastal region for almost one decade. These new homes projects contribute to increasing the ecological footprint. The standardised houses are individual units for one family (low density, instead of middle or high-density housing), which means municipal higher costs for the construction of infrastructure and basic services. Additionally, the repetition of standardised models of houses without any respect for the local architecture or identity has been a serious problem. The urban image is the same as in any middle and low income neighbourhood of the large coastal cities Guayaquil or Manta, and local architectural heritage is not being produced. The relocation of families is not entirely successful in the reality. The problem behind informal housing still exists despite the efforts to control it. The demand for affordable land for low income families has been increasing. Like in other cities of the developing and less developed world, the estate market considers this type of land as not suitable due to its bad location, its risky exposure to natural disasters, or its poor quality.

Finally, the construction of social housing does not necessarily contribute to the reduction of the demand for land for residential use. To the contrary, it increments the pressure along the urban border, and simultaneously, on the national reserve that surrounds it. The construction of basic infrastructure (water and sewage systems, electricity, streets, and others) for new residential areas localised at the periphery of urban areas triggers the valorisation of the surrounding land and the dynamics of the land market. Progressively, new houses, retail and other services will be allocated nearby (Figure 111).

Figure 111: Social housing project in Puerto Lopez, Ecuador (Source: MIDUVI, 2012)

7.1.4. Macro plots and gated communities (F-4)

Macro plots are also part of the newly expanded urban areas located in the northern and eastern peripheries. This urban form is shaped by nine different and dispersed polygons, which sum a total surface of 113.51 hectares, i.e. 34.67% of the total urban surface in 2010 (Figure 112).

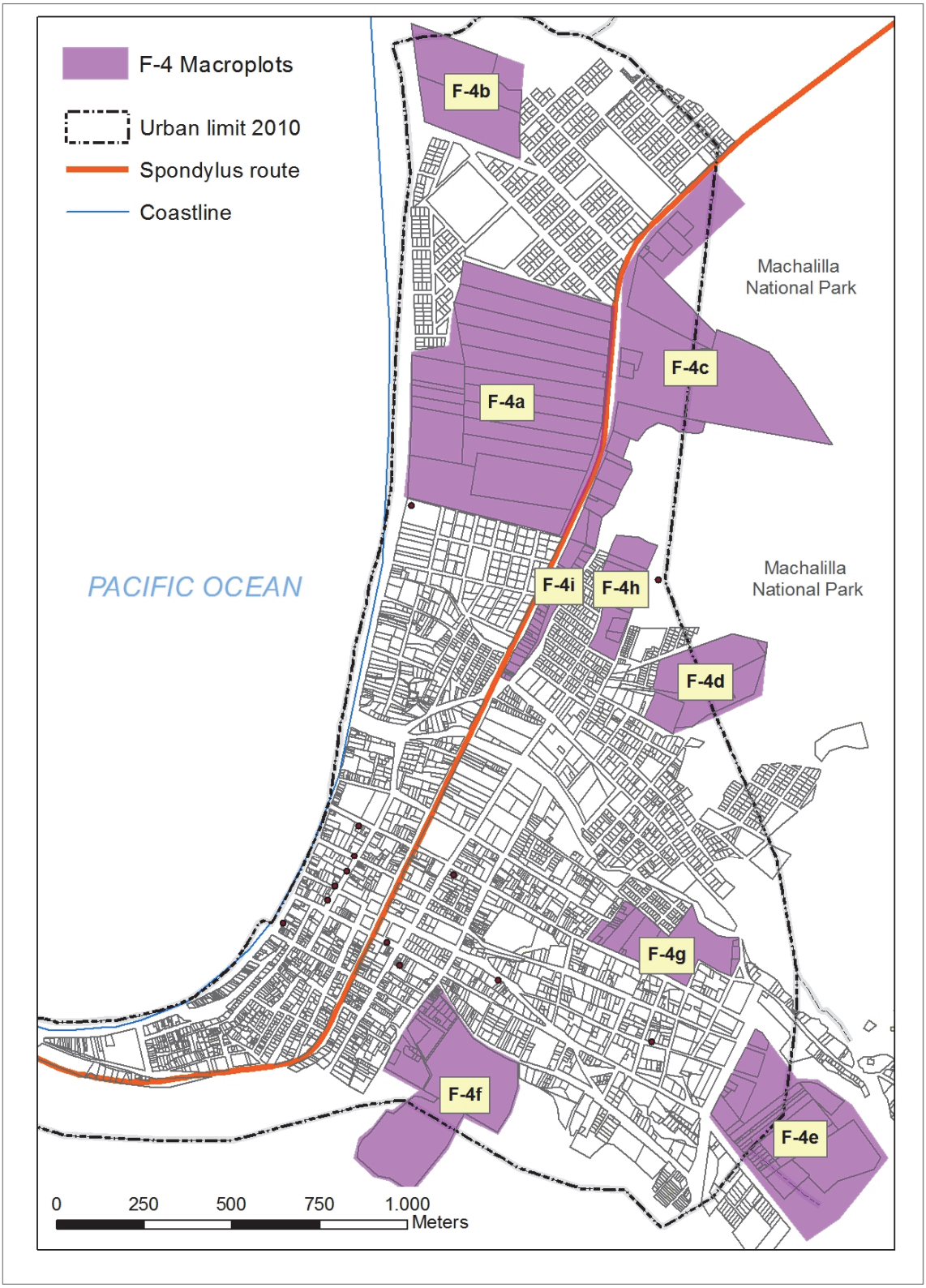
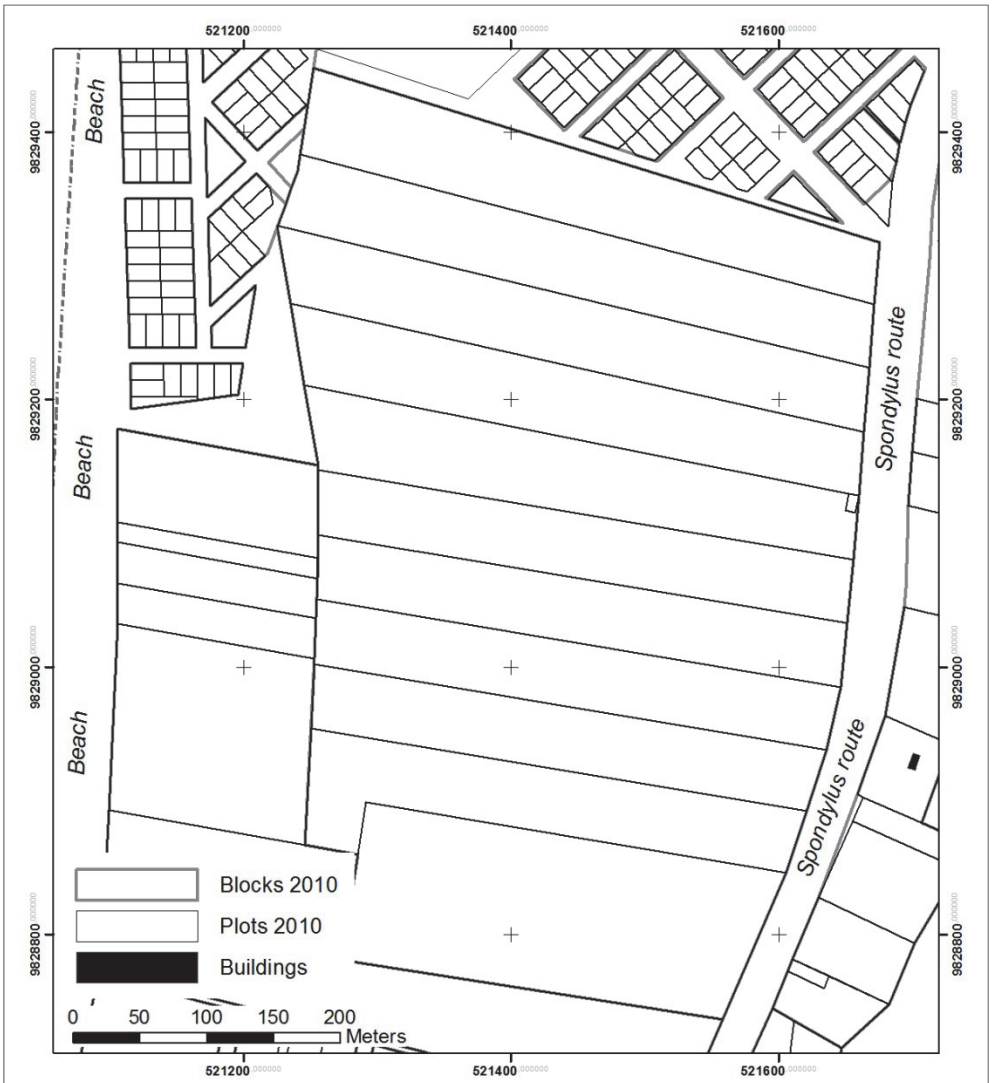


Figure 112: Location F-4 (Source: Own draft, 2016)

Gated communities have been considered as the built form and emblem of the social and spatial fragmentation triggered by the extreme levels of social inequality in the Latin American metropolis (De Mattos, 2010). Nevertheless, this urban form is no longer a particular element of the contemporary urban areas in the developing world. Nowadays, gated communities are also emerging near tourist towns as second homes from middle income and high income urban families (Figure 113).



Predominant morphocode	1DDA-2CD-3DB Extreme fragmented macroplots
Location	Northern periphery
Topography	Predominantly flat
Population density	Low: 6 - 22 inhabitants per hectare
Land use	Developable land (gated communities and tourist resorts)
Access to basic services	Bad: 8%-50% water, 0%-2% sewage, 91%-94% electricity
Quality of buildings	Bad: 12% of houses with walls in bad conditions
Exposure	High: High-tides, tsunamis, erthquakes, and floods

Figure 113: Urban grain F-4 (Source: Own draft, 2016)

Additionally, enclosed neighbourhoods are offered to foreign retirees who come to live their last days in the middle of nature and paradisiacal landscapes. For the last ten years, several gated

communities have been built along the Spondylus Route. They have similar features like the gated communities in the major cities: perimeter walls, identification control at all entrances, security guards, security cameras, alarms, as well as large ornamental green areas, parking areas, interior public spaces like parks, tennis courts, football courts, and swimming pools. The size, ornamentation, and urban design of each enclosed neighbourhood vary depending on the purchasing power of the target clients (Figure 114).

Figure 114: Predominant morphocode F-4 (Source: Own draft, 2016)

Likewise, the quality of basic services, infrastructure, green areas, and urban design are mainly better than in the nearest towns. In fact, some are partially independent of the basic public services provided by local governments. Due to the bad quality of the piped water service and the instability of the provision of electric energy in rural areas, some gated communities have their own potable water system, wastewater treatment system, and energy generators. In the case of Puerto Lopez, the majority of macro plots located in the northern area have irregular shapes and have more than 10,000 square meters.

Despite the traditional scarcity of potable water in rural regions along the central coast, gated communities expend thousands of cubic meters per year on irrigation of green areas and filling of swimming pools. Particularly, in high income enclosed neighbourhoods the abundance of ornamental green areas and pools is a symbol of the quality of the urban space and social status (Figure 115). However, this particular way of life sharply contrasts with the extreme levels of poverty and vulnerability in towns. As it has previously been described in Chapter 5, potable water is a limited basic service for low income families of Puerto Lopez. By taking this reality in consideration, this type of urban form could be perceived as opulence. There are several gated communities dispersed along the Spondylus region. In 2015, there was any gated community identified inside the urban area of Puerto Lopez. The nearest one is located about 8 kilometres north of Puerto Lopez (around 10 minutes by car) in the fishing village of Machalilla. Nevertheless, with the official nomination of this town as a Protected Tourist Area, the probability of constructing of this type of urban form is extremely high and is also expected by the local government and private investors.

Figure 115: Gated community La Arboleda, Manta (Source: Pozo, 2015)

7.1.5. Private tourist infrastructure (F-5)

With 11.70 hectares, this urban form is located along the beach and the commercial streets, but is also randomly dispersed across the city. The most significant concentrations are in the sectors: F-5a (north beach), F-5b (south beach and downtown), and F-5c (eastern hills) (Figure 116).

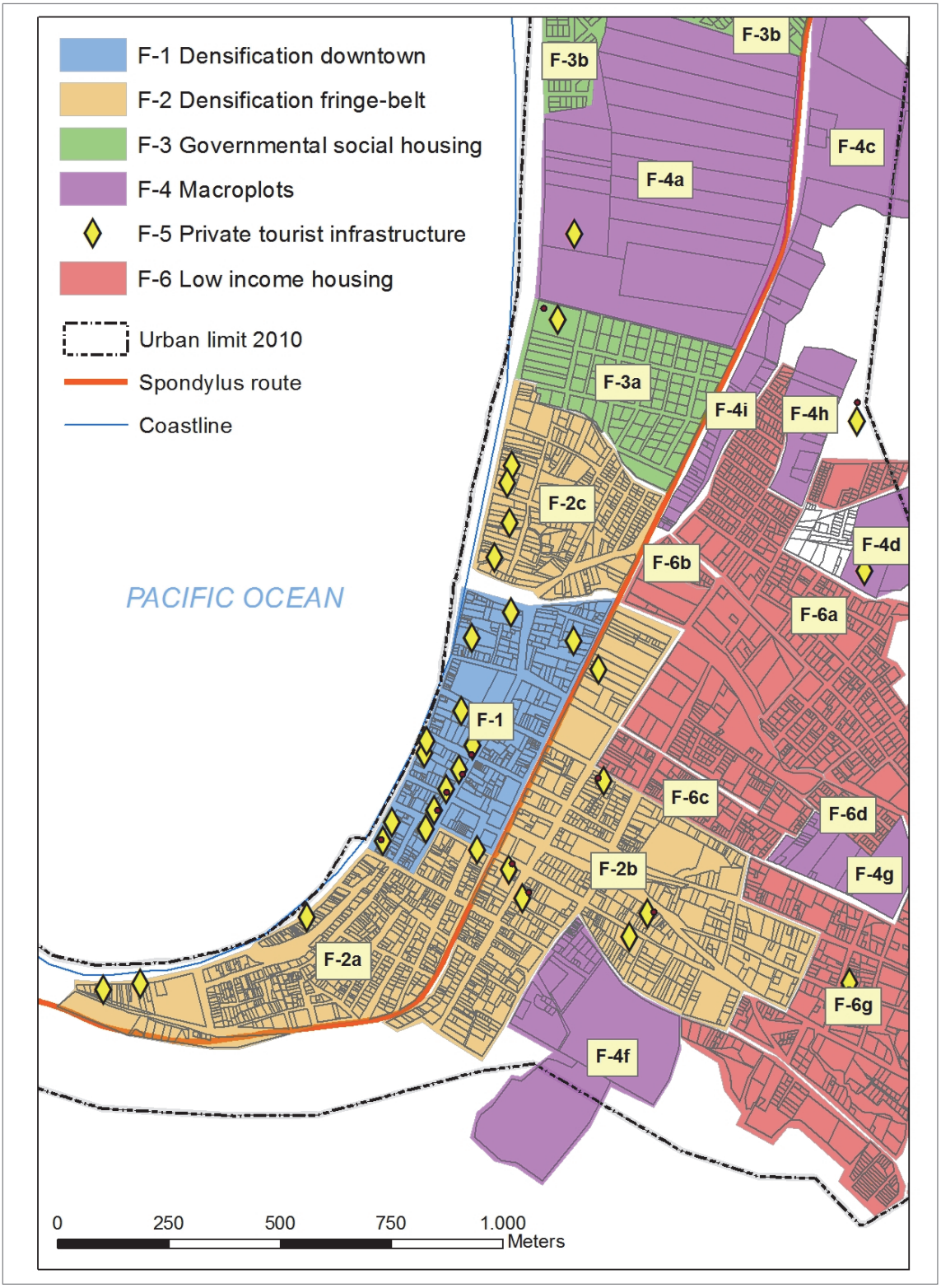


Figure 116: Location F-5 (Source: Own draft, 2016)

In 2010, there are four main types of private tourist buildings in Puerto Lopez: (1) Lodges, (2 and 3) hotels, (4, 5, and 6) rustic bungalows or *hosterias*, and (7, 8, and 9) informal lodging or *hostels* (Figure 117).

Figure 117: Accommodation in Puerto Lopez (Sources: http://www.booking.com [1-6], Pozo, 2012 [7-9])
(1) Mantaraya Lodge, (2) Hotel Pacífico, (3) Hotel Victor Hugo, (4) Hosteria Mandála, (5) Hosteria Itapoa, (6) Cabañas Playa Sur (7) Hostal Máxima, (8) Hostal Fragata, and (9) Hostal Monte Libano.

Lodges (1) are the most expensive tourist private infrastructure in the majority of coastal towns along the Spondylus Route. Usually, they are located outside the urban areas and isolated in the middle of nature. International tourists and elites from the largest Ecuadorian cities are the main clients. Despite the fact that lodges have not the same size and complexity like beach resorts in the Caribbean, they represent a huge private economic inversion due to the costs of providing services independently from basic urban infrastructure.

Hotels (2 and 3) in Puerto Lopez are small and with a basic range of services. They target clients are international tourists and middle income families. They offer comfortable rooms (standardised according to the basic tourist international demand), with air conditioning, wireless internet network (Wi-Fi), hot water, parking place, and restaurant. Hosterias (4, 5, and 6) are a local adaptation of tourist *bungalows* or summer camping fields of Europe. They are composed by a several *cabañas* or rustic cabins surrounded by nature and common spaces for leisure and rest. The quality of the architectural design and construction varies considerably.

Hostales or hostels (7 and 9), are conceived as low-cost accommodation for groups of young tourists and backpackers. The majority of them emerged by the initiative of local investors, who found a new source of incomes in tourism. Additionally, there is a fifth type of tourist accommodation implemented by low income native families. They rent low-cost rooms in their houses or in new houses constructed inside the own plot, which is also named as *hostales* or low-cost pensions (8). Regarding the location, there are three main patterns of settling the private tourist infrastructure in tourist beach towns like Puerto Lopez: (a) centralised, (b) peripheral, and (c) satellite.

(a) Centralised: hotels, hostels, and low-cost pensions

In a first phase, the majority of hotels and hostels (low-cost lodging) settled downtown, as near to the beach as possible. In some way, they are also part of the process of densification and fragmentation of the downtown lots and blocks. The main reasons to localise in downtown seem to be the access to basic services, the proximity to the beach, and the close interaction of people along commercial streets. Usually, newly constructed hotels are the property of foreign investors (from the largest cities or international) and are located on the most expensive plots along the *Malecón* or beach. The size of the plot is small and medium and with a high population density. On the other hand, the low-cost pensions are mostly owned by local families who progressively expand their houses by one or two floors. The quality of construction is poor, and the spaces are not standardised. However, there is a regular demand for them by backpackers, who look for cheap and safe lodging.

(b) Peripheral: hosterias

The outer areas are also preferred by tourist investors to localise low-cost hostels and hosterias. The selection criteria are mainly based on price, accessibility and panoramic view. The hilly urban periphery of Puerto Lopez still contains cheap land, which is well connected to the downtown and the beach by the Spondylus Route, and with an amazing panoramic view of the natural landscape. They are localised in the south *(Punta Piedrero),* in the north (macro plots that destroyed the mangrove forest), and on the top of the eastern hills which have an amazing panorama of Puerto Lopez bay.

The sizes of the plots vary from medium to large and usually have a low or medium population density. The location is within walking distance to downtown and the beach. Regularly, depending on the tourist season, the prices for renting a room are low. Many of the owners try to take the maximal advantage of the backyards and build other complementary facilities for tourists like camping areas, parking places or spaces for grilling. Other hosterias, which are not surrounded by an attractive built or natural landscape, reproduce the natural landscape inside large plots to create the sensation of being lodged in the middle of nature. The rooms are not

centralised in one building, but they are spread in rustic cabins or huts connected by walking paths. In all the spaces between cabins, there are green areas with exotic and ornamental plants.

(c) Satellite: lodges

Lodges and high-cost hosterias tend to be localised on the peripheries of the town and also beyond in the middle of nature. This type of location could also be referred to as satellite development. The main reason that stimulates this pattern of settling is to offer to the tourist the experience of living in the middle of real nature (inside the national park) and disconnected from any urban or modern artificial environment. On the one hand, foreign investors seek to avoid the chaos and bad quality of the urban space. Additionally, their capacity of investment allows them to construct their own essential and tourist infrastructure inside their resorts. They do not depend on the basic services and infrastructure of the towns provided by the local government. On the other hand, they try to take advantage of the natural landscape by allocating their hotels in the middle of nature or with a direct view of the sea and beach. The promotion of ecotourism lodges demands the incorporation of pristine nature as part of the offer. In the case of Puerto Lopez, the Machalilla National Park means an invaluable resource to increase the value of their offer and the possibility to attract international tourist.

Like in gated communities, several features contrast with the reality that happens on the other side of the walls. The use of green ornamental areas, the overuse of water for filling pools and irrigation, and the dependency of active air conditioning systems are examples of the wasteful spending of scarce resources by standardised tourism services. In Ecuador, the practice of ecotourism has been growing for the last decade. New tourism services have expanded due to the popularisation of new activities related to the natural landscape. Nevertheless, along with the Spondylus Route, the majority of the tourism offers are not based on the global definition of ecotourism.

In the following figure, there are two hosterias located in the Z1-S3 sector, which is the area of urban expansion along the beach where the majority of private tourist infrastructure would be settled. The urban grain is shaped by vast and medium size plots between 1,000 and 10,000 square meters of the surface. Particularly, tourist investors prefer this type of plots due to the accessibility to the beach and the possibility of building bungalows and other dispersed leisure infrastructures like pools, green areas, parking places, soccer fields, bamboo and wood cabins, camping fields, and many others. The main objective behind the hosterias concept, as a type of tourist accommodation, is to offer to their clients the sensation of been lodged in the middle of the natural landscape but directly connected with the town and the beach at the same time. It could be understood as an “island” of nature inside the urban area (Figure 118).

Figure 118: Predominant morphocode F-5 (Source: Own draft, 2016)

7.1.6. Low income housing (F-6)

In total, eight polygons of this form were identified in the eastern area and periphery (F-2a, F-2b, F-2c, F-2d, F-2e, F-2f, F-2g, and F-2h), which sum up to 66.67 hectares or 20.36% of the total urban surface of Puerto Lopez in 2010 (Figure 119).

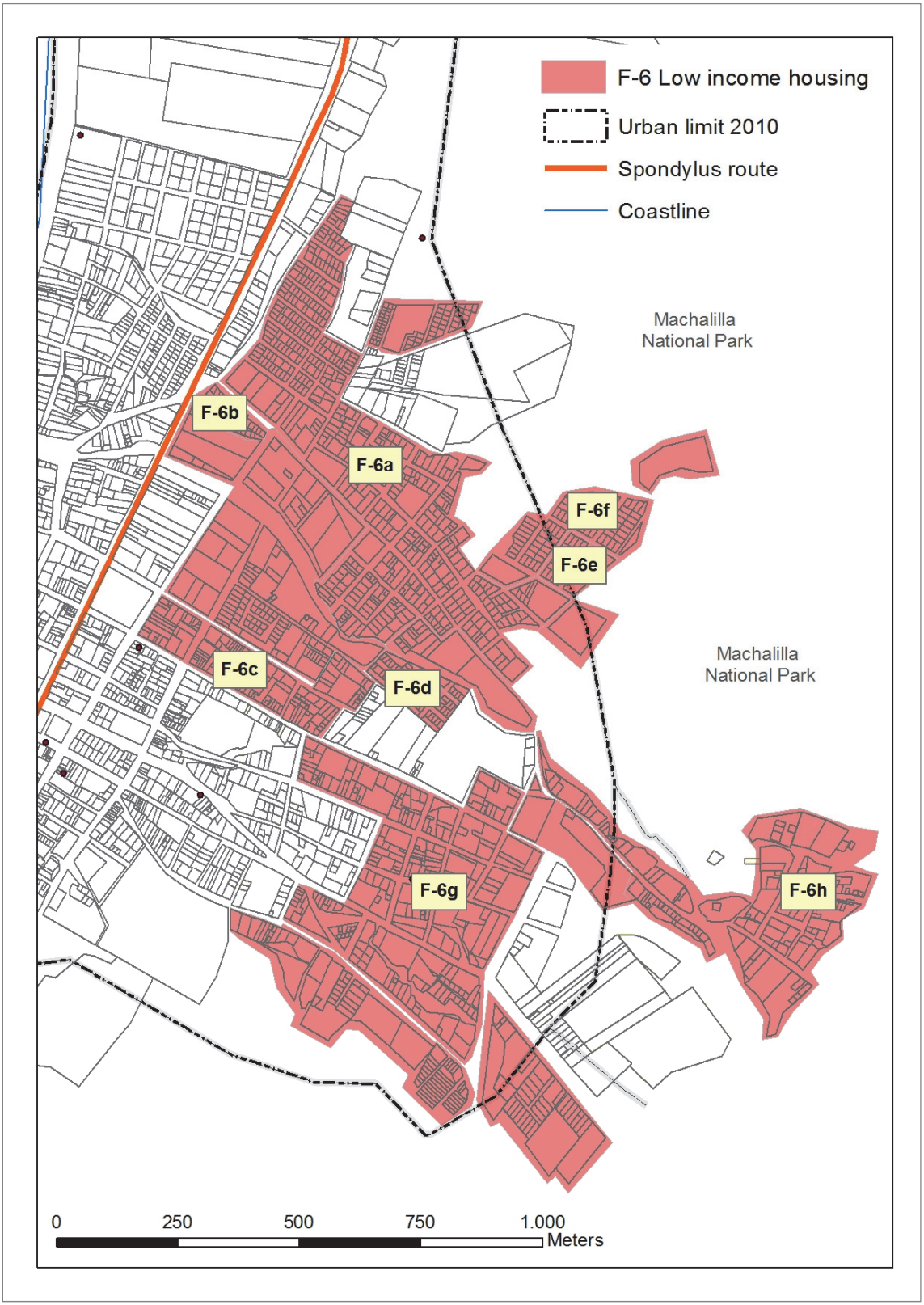


Figure 119: Location F-6 (Source: Own draft, 2016)

Weak urban planning and the intensive demand of affordable land for settling have been contributed to the rapid and uncontrolled urban growth. Nevertheless, the quality of the built space and the quality of life inside these new neighbourhoods are clearly unsustainable. The physical vulnerability and exposure experienced by the low income families have contributed significantly to the decrease of resilience in the entire town (Figure 120).

Predominant morphocode	1BAA-2BB-3CB High fragmented
Location	Eastern periphery, "Miramar" and "Luis Gencón"
Topography	Predominantly hilly
Population density	Medium: 23 - 45 inhabitants per hectare
Land use	Residential (informal housing)
Access to basic services	Bad: 66%-81% water, 0% sewage, 91%-94% electricity
Quality of buildings	Bad: 12%-15% of houses with walls in bad conditions
Exposure	High: Landslides, earthquakes and floods

Figure 120: Urban grain F-6 (Source: Own draft, 2016)

The largest areas of informal low income housing in Puerto Lopez have been settled in the hilly southern lands. Progressively, they have been legalised by the local government and, therefore, have been provided with essential services and infrastructure. According to the local government, there are around 3,000 illegal plots in Puerto Lopez in 2015. The majority of them

are located in the northern and eastern expansion areas. In the case of the eastern sectors, where the topography is predominantly hilly, and the quality of the soil is not right, the urban grain is fragmented. Blocks and plots with irregular forms are the consequence of the adaptation of the newly built space to the rough terrains. Particularly, the plots settle along natural channels, or streams represent a serious exposure in the case of floods or landslides during the rainy season (Figure 121 and Figure 122).

Figure 121: Predominant morphocode F-6 (Source: Own draft, 2016)

Figure 122: Low income houses located near the downtown (Photo: Pozo, 2015)

7.2. Assessing sustainability of the built space

7.2.1. Urban indicators of sustainability

In total, 19 indicators of sustainable urban development were selected to measure the quality of the urban growth in Puerto Lopez. They were chosen regarding the existence of similar statistical variables in the Ecuadorian national census of 1990, 2001, and 2010 (Table 25).

Matching urban indicators from UN-Habitat with existing official statistics in Ecuador (1990-2010)									
UN-HABITAT INDICATORS					ECUADORIAN NATIONAL CENSUS				
Chapter	No	Habitat Agenda	Type	Indicator (UN-Habitat)	No.	Indicators in Ecuadorian National Census	Unity	Scale	Year
1.Shelter	1	Promote the right to adequate housing	A1	Durable structures	1	Percentage of homes living in houses unsuitable conditions	%	C	1990 2001 2010
					2	Percentage of houses with walls made of cement or clay bricks	%	S	2010
					3	Percentage of houses with floors made of concrete subfloor or covered by ceramic tiles	%	S	2010
	2		A2	Overcrowding	4	Percentage of homes living in crowded conditions	%	C	1990 2001 2010
	3	Promote access to basic services	A4	Access to safe water	5	Percentage of houses with potable water supply inside by public network	%	C	1990 2001 2010
					6	Percentage of houses with accessibility to potable water by public network	%	S	2010
	4		A5	Access to improved sanitation	7	Percentage of houses with discharge of wastewater by a public network	%	C	1990 2001 2010
					8	Percentage of houses with accessibility to sewerage public network	%	S	2010
	5		A6	Connection to services	9	Percentage of houses with electricity public service	%	C	1990 2001 2010
					10	Percentage of houses with accessibility to the internet	%	S	2010
					11	Percentage of houses with phone service	%	C	1990 2001 2010
2.Social development and eradication of poverty	6	Provide equal opportunities for a safe and healthy life	A7	Under-five mortality	12	Infant mortality rate (per each 1000 live births)	%	C	1990 2001 2010
	7	Promote social integration and support disadvantaged groups	A9	Poor households	13	Percentage of poor inhabitants per UBN	%	C	1990 2001 2010
					14	Percentage of poor inhabitants per UBN	%	S	2010
	8	Promote gender equality in human settlements	A10	Literacy rates	15	Illiteracy rate	%	C	1990 2001 2010
					16	Percentage of illiterate inhabitants	%	S	2010
3.Environmental management	9	Promote geographically balanced settlement structures	A11	Urban population growth	17	Population growth annual rate	%	C	1990 2001 2010
					18	Population quantity	#	S	2010
					19	Population density	In/Ha	S	2010

Table 25: UN-Habitat indicators and Ecuadorian census (Source: United Nations, 2004, pp. 8-9)

7.2.2. Shelter: Promote the right to adequate housing (A1 and A2)

The evolution of the quantity (1990-2010) and the quality of houses regarding conditions of roofs, walls, and floors (2010) were selected as main variables to measure the right to adequate housing and the levels of exposure to natural disasters (Table 26).

Number	Sector		Urban form	Number of houses 1990	Number of houses 2001	Number of houses 2010	Rate of increase of houses 1990-2001	Rate of growth of houses 2001-2010	Number of houses per hectare (2010)
1	Z1-S1	F-3b	F-4b	-	5	146	-	**97%**	3.87
2	Z1-S2	F-3a	F-4a	-	65	86	-	24%	1.37
3	Z1-S3	F-2c	F-5b	56	66	88	18%	25%	4.45
4	Z1-S4	F-1	F-5a	69	115	143	67%	20%	13.64
5	Z1-S5	F-1	F-5a	57	107	112	88%	4%	14.28
6	Z1-S6	F-2a	F-6	77	100	124	30%	19%	27.69
7	Z1-S7	F-2a	F-6	62	120	159	**94%**	25%	37.56
8	Z1-S8	F-2a	F-5a	62	105	142	69%	26%	25.38
9	Z1-S9	F-2	F-5b	-	92	126	-	27%	7.21
10	Z2-S1	F-4c	F-4i, F4h	-	104	113	-	8%	3.57
11	Z2-S2	F-6a	F-4d, F-5c	-	126	83	-	52%	5.37
12	Z2-S3	F-6a	F-6e, F-6f	57	60	204	5%	**71%**	7.51
13	Z2-S4	F-6c	F-6d, F-4d	29	60	196	**107%**	**69%**	7.15
14	Z2-S5	F-2b	F-5a	98	124	157	27%	21%	12.37
15	Z2-S6	F-6g	F-4e, F-4f	-	121	171	-	29%	3.53
16	Z2-S7	F-2b	F-5a	-	60	93	-	35%	8.88
17	Z2-S8	F-2b	F-5a	-	61	95	-	36%	16.59
18	Z2-S9	F-2b	F-5a	-	119	165	-	28%	4.95
Total				**984**	**1,610**	**2,403**	**64%**	**33%**	**6.25**

(*) The selected statistical sample was*: private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 26: Evolution of the number of dwellings (Source: INEC, 2010)

In 1990, Puerto Lopez had 984 individual houses, which were mostly localised in downtown and along the Spondylus Route (F-1, and F-2a). During the following two decades, 1,419 more new houses were built, and the urban limit was expanded. The highest increase in number of houses was between the years 2001 and 2010 and was mainly concentrated in the northern social housing F-3b and eastern sectors of low income housing F-6. In 2010, the downtown F-1 had the highest density of houses (18 – 38 houses per hectare), which supports the assumption of an intensive densification process (population + housing) and parcelling of its blocks and plots during the last decade (Figure 123).

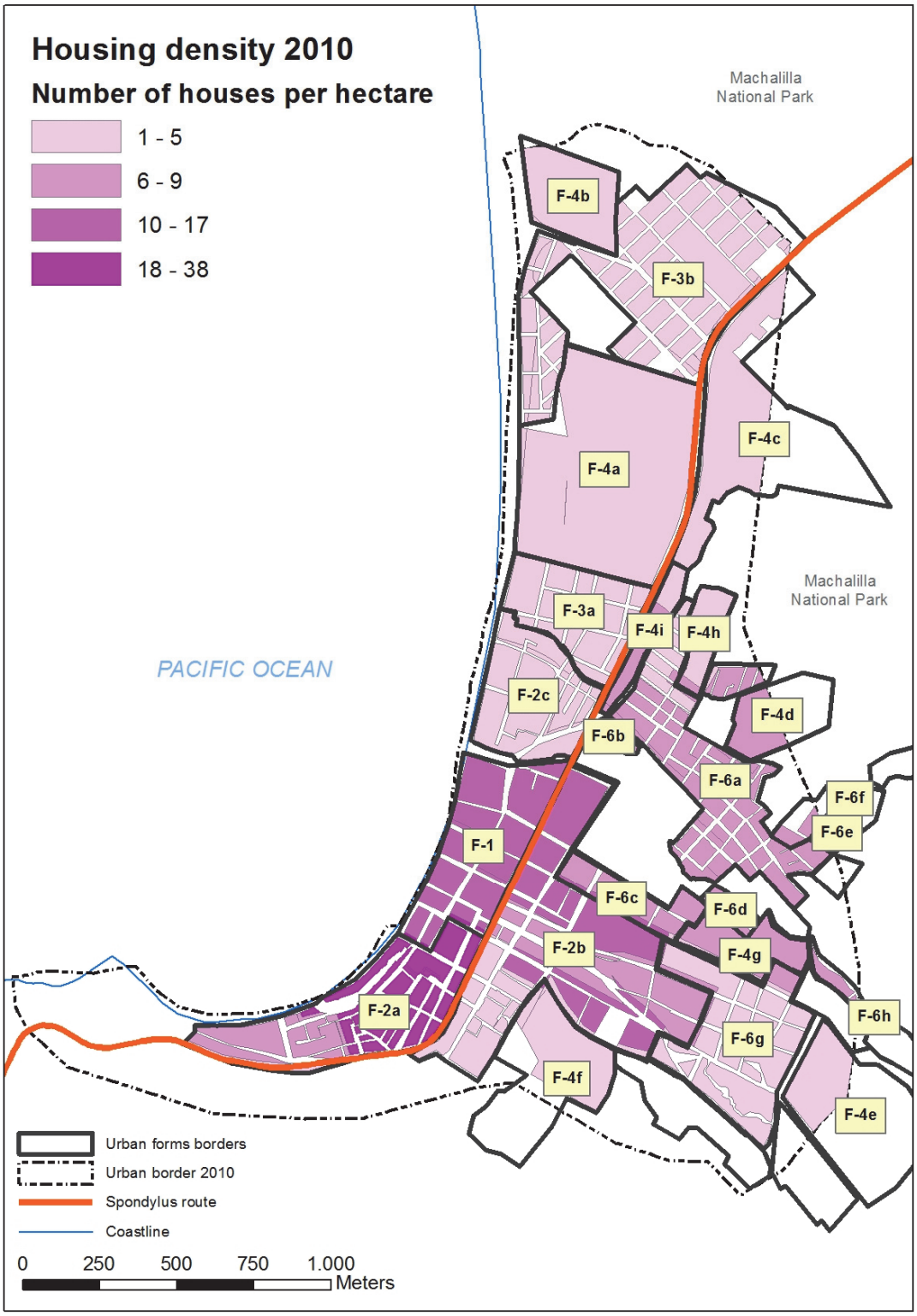


Figure 123: Housing density per urban forms (Source: Own draft, 2016)

In 2010, the highest percentages of houses with roofs, floors, or walls in severe conditions were concentrated in the urban forms F-3b (social housing), F-2a (fringe belt), F-6a, and F-6g (low income housing). The range is between 24% and 29% of houses with one of these elements of poor condition. Particularly, the urban form F-2a is localised in the area where the fishing town

was initially settled (southern part of the beach). In these areas, the level of exposure is high in the case of natural disasters like floods, tsunamis or earthquakes.

Number	Sectors	Urban forms 2010		Percentage of houses in bad conditions (roof) 2010	Percentage of houses in bad conditions (walls) 2010	Percentage of houses in bad conditions (floor) 2010	Number of houses per sector (2010)
1	Z1-S1	F-3b	F-4b	**14%**	**17%**	**42%**	146
2	Z1-S2	F-3a	F-4a	13%	12%	14%	86
3	Z1-S3	F-2c	F-5b	19%	22%	22%	88
4	Z1-S4	F-1	F-5a	22%	15%	18%	143
5	Z1-S5	F-1	F-5a	15%	14%	16%	112
6	Z1-S6	F-2a	F-6	19%	14%	22%	124
7	Z1-S7	F-2a	F-6	**31%**	**27%**	**26%**	159
8	Z1-S8	F-2a	F-5a	**29%**	**18%**	**20%**	142
9	Z1-S9	F-2a	F-5b	**28%**	**18%**	**18%**	126
10	Z2-S1	F-4c	F-4i, F4h	22%	20%	21%	113
11	Z2-S2	F-6a	F-4d, F-5c	17%	12%	22%	83
12	Z2-S3	F-6a	F-6e, F-6f	**24%**	**15%**	**28%**	204
13	Z2-S4	F-6c	F-6d, F-4d	14%	14%	21%	196
14	Z2-S5	F-2b	F-5a	18%	15%	17%	157
15	Z2-S6	F-6g	F-4e, F-4f	**24%**	**23%**	**24%**	171
16	Z2-S7	F-2b	F-5a	19%	14%	18%	93
17	Z2-S8	F-2b	F-5a	15%	17%	24%	95
18	Z2-S9	F-2b	F-5a	13%	14%	14%	165
					Total		**2,403**

Table 27: Percentage of houses in bad conditions per sectors 2010 (Source: INEC, 2010)

By the *incremental growing* of houses in low income areas, the quality of the main components (roof, floor and wall) is an indicator which provides clues to understanding the levels of exposure to natural disasters. Particularly, the quality of external walls of houses is an indicator of their good or bad conditions. Usually, the conditions of roofs and floors could be bad without affecting the quality of life inside the house. During the process of incremental growing, which could take years or decades, the replacement or no replacement of the roof and floor could be managed by the families without a problem (Figure 124).

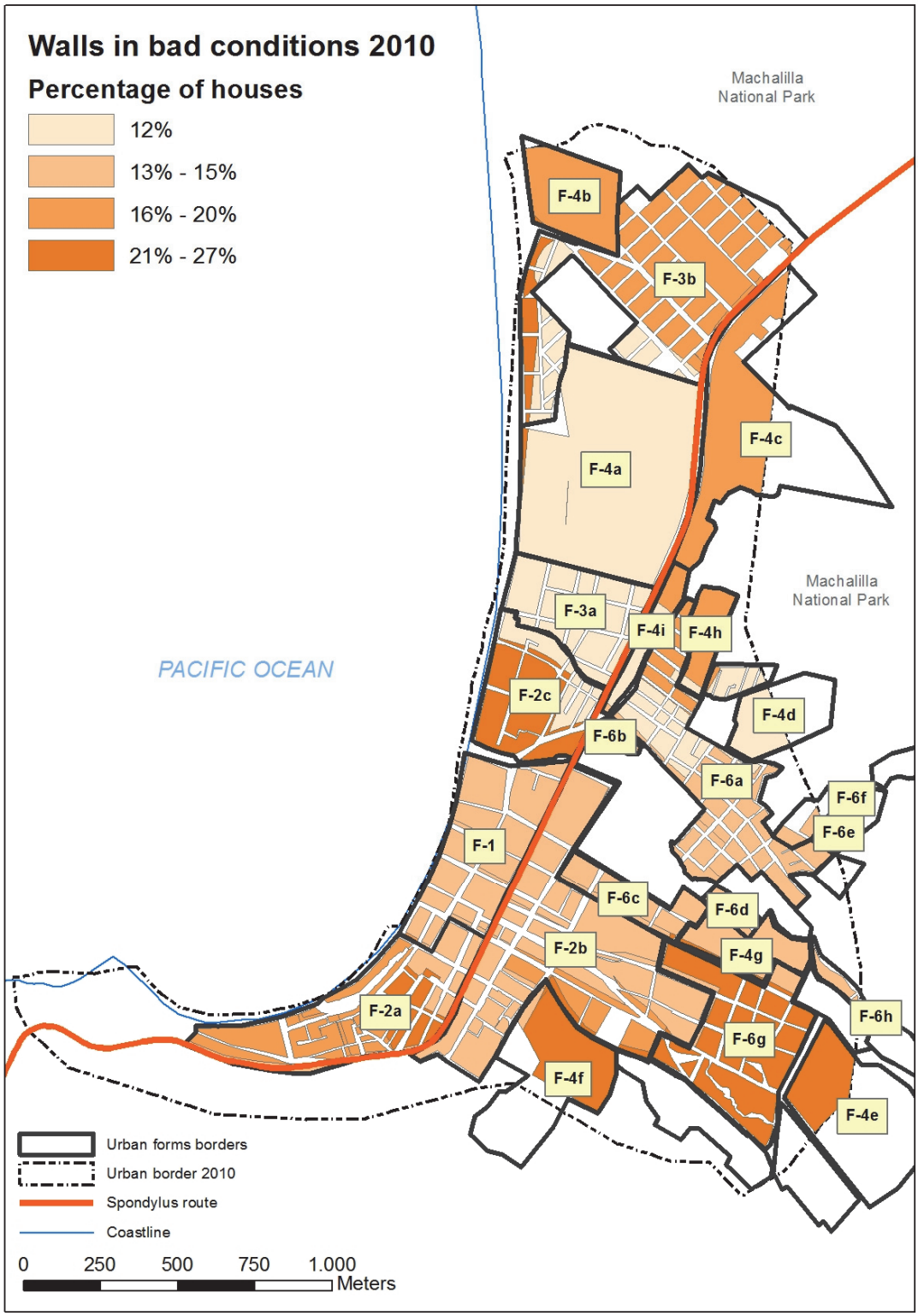


Figure 124: Houses with external walls in bad conditions (Source: Own draft, 2016)

Likewise, the bad condition of roofs is not necessarily a meaning of extreme poverty. Due to the high costs, the replacement of roofs could be delayed for several years. The cheapest roof material preferred by low income families is the zinc undulating sheet, which is replaced after long periods by asbestos undulating sheets. Both have a relatively long time life, but the

deterioration of its external surface is rapid due to the saline, wet, and sunny environment (Figure 125).

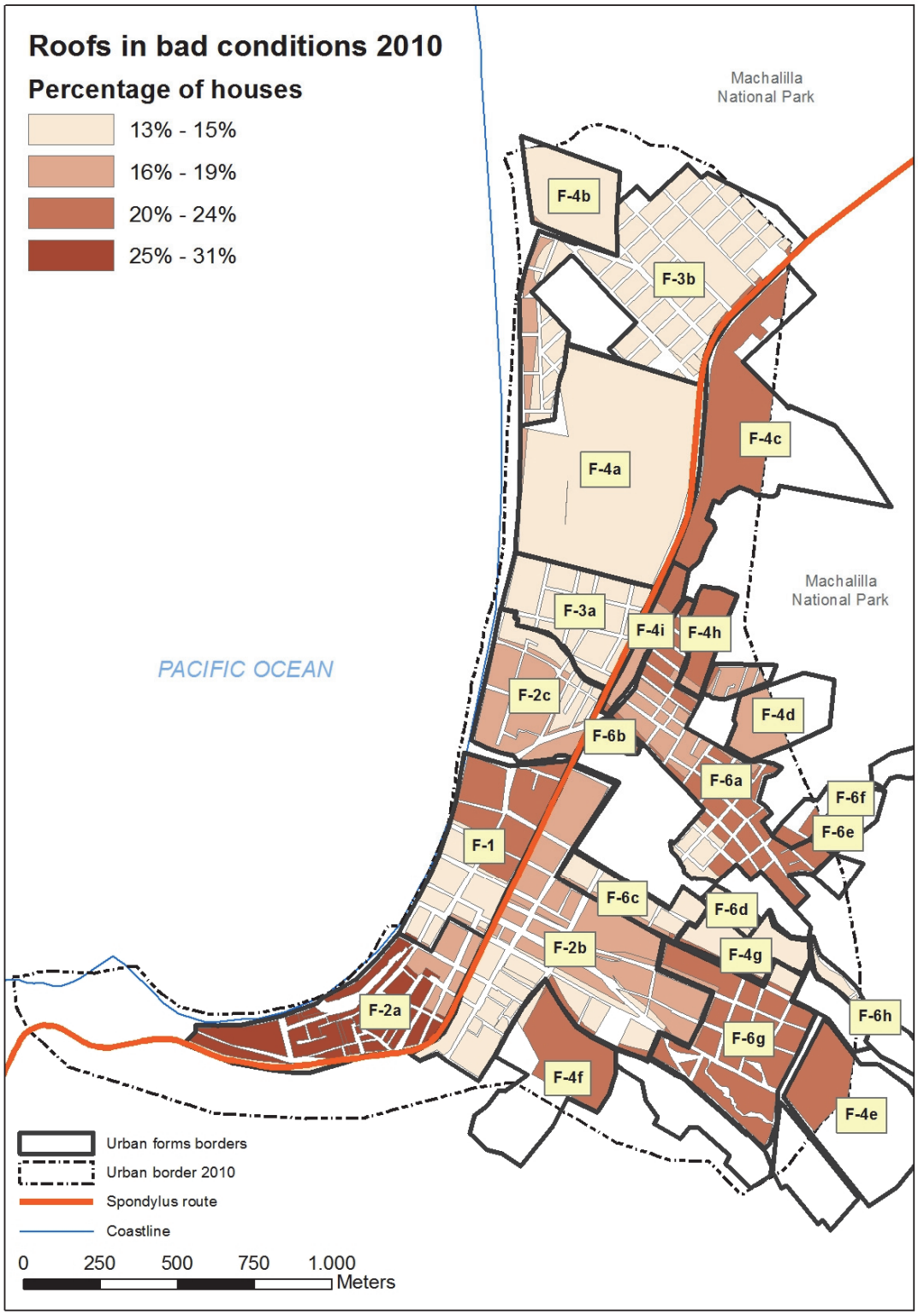


Figure 125: Houses with roof in bad conditions (Source: Own draft, 2016)

The replacement or improvement of the floor is also a long-term process. From a basic floor made of wood planks, it is progressively replaced by concrete and ceramic floor tiles. Likewise, the installation of the floor covering is self-made by the same owners. One of the most popular

types of floor used in rural areas and low income housing is the *hormigón pulido* or polished concrete floor. It is the concrete floor but with a polished and lustrous finished to eliminate the typical corrugated texture, which is easier to clean and looks similar to the ceramic tiles (Figure 126).

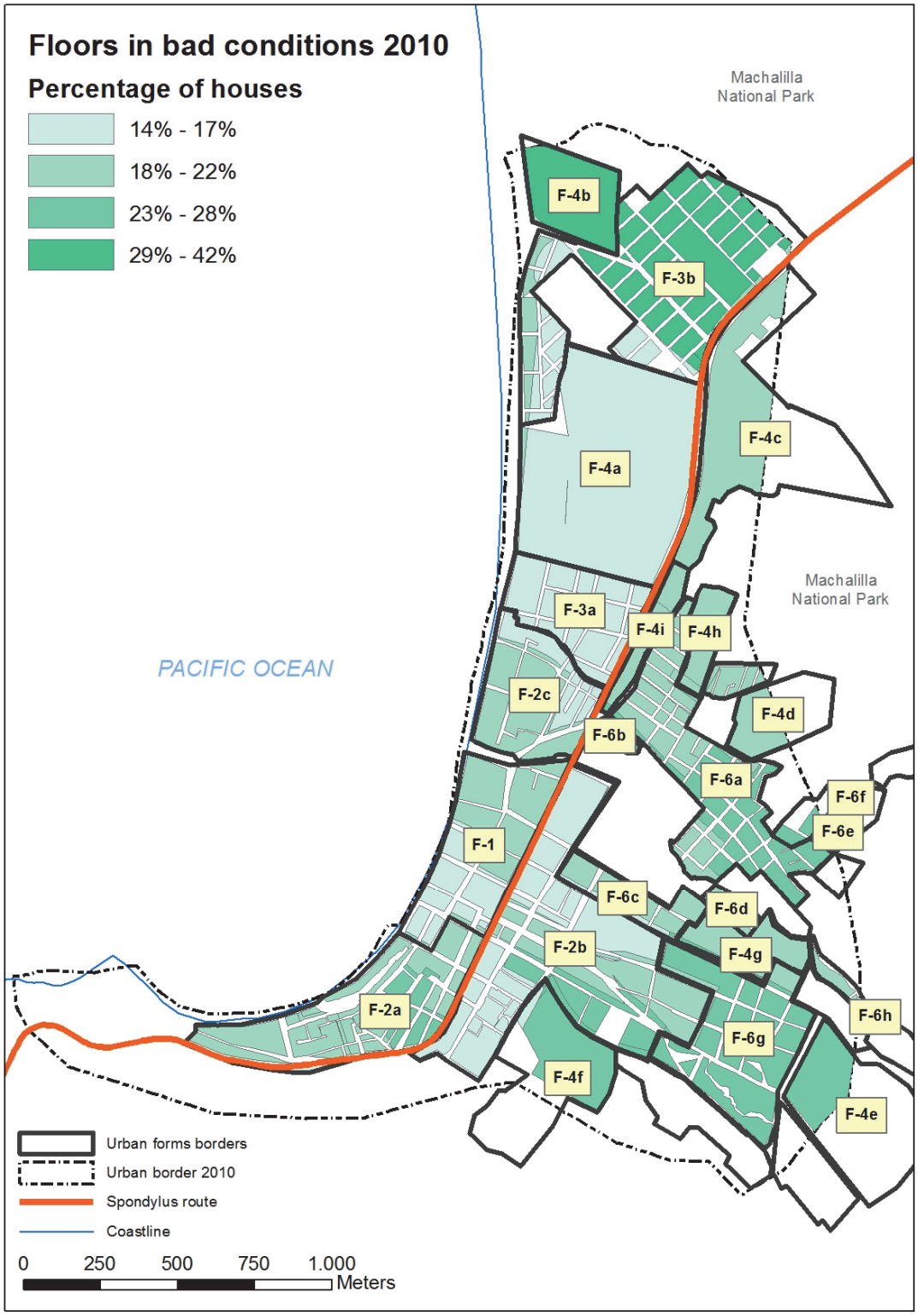


Figure 126: Houses with floors in bad condition (Source: Own draft, 2016)

The worst quality of housing concentrated in the southern F-2a, and northern F-2c fringe belt, as well as in the north and eastern expansion areas (F-3b, and F-3b). The predominance of incremental growing and informal construction in the low income housing settled on these peripheral urban sectors are the main reasons that argument the high number of houses with a deficient physical condition.

The physical evolution of housing can be observed by comparing the use of materials in external walls during the last two decades. In the following table, statistics of the national census of housing registered the predominance of materials in walls of individual houses per sectors in 1990, 2001, and 2010. Letter *A* corresponds to the walls made of cement blocks, and clay bricks. Letter *B* identifies the walls made of wood, bamboo, adobe, or others (Table 28).

Percentage of houses with walls made of bricks or concrete (A) or of adobe, bamboo, wood or others (B) 1990, 2001, 2010.									
ID	SECTOR	Urban forms 2010		1990		2001		2010	
				A	B	A	B	A	B
1	Z1-S1	F-3b	F-4b	-	-	68%	32%	20%	80%
2	Z1-S2	F-3a	F-4a	-	-	67%	33%	86%	14%
3	Z1-S3	F-2c	F-5b	49%	51%	67%	33%	81%	19%
4	Z1-S4	F-1	F-5a	79%	21%	85%	15%	90%	10%
5	Z1-S5	F-1	F-5a	81%	19%	91%	9%	96%	4%
6	Z1-S6	F-2a	F-6	82%	18%	81%	19%	94%	6%
7	Z1-S7	F-2a	F-6	77%	23%	74%	26%	91%	9%
8	Z1-S8	F-2a	F-5a	77%	23%	83%	17%	89%	11%
9	Z1-S9	F-2	F-5b	88%	12%	84%	16%	95%	5%
10	Z2-S1	F-4c	F-4i,F4h	-	-	36%	64%	61%	39%
11	Z2-S2	F-6a	F-4d,F-5c	-	-	43%	57%	70%	30%
12	Z2-S3	F-6a	F-6e,F-6f	49%	51%	61%	39%	68%	32%
13	Z2-S4	F-6c	F-6d,F-4d	69%	31%	60%	40%	81%	19%
14	Z2-S5	F-2b	F-5a	69%	31%	80%	20%	94%	6%
15	Z2-S6	F-6g	F-4e,F-4f	-	-	74%	26%	76%	24%
16	Z2-S7	F-2b	F-5a	-	-	69%	31%	79%	21%
17	Z2-S8	F-2b	F-5a	-	-	69%	31%	85%	15%
18	Z2-S9	F-2b	F-5a	-	-	77%	23%	91%	9%
A= Walls made of bricks or concrete; B= Walls made of adobe, bamboo, wood, or others.									

Table 28: Wall material of houses 1990 - 2010 (Source: INEC, 2010)

While in 1990 and 2001 the percentage of external walls made of cement blocks and clay bricks were slightly more, in 2010 the predominance of concrete is strongly marked (Figure 127).

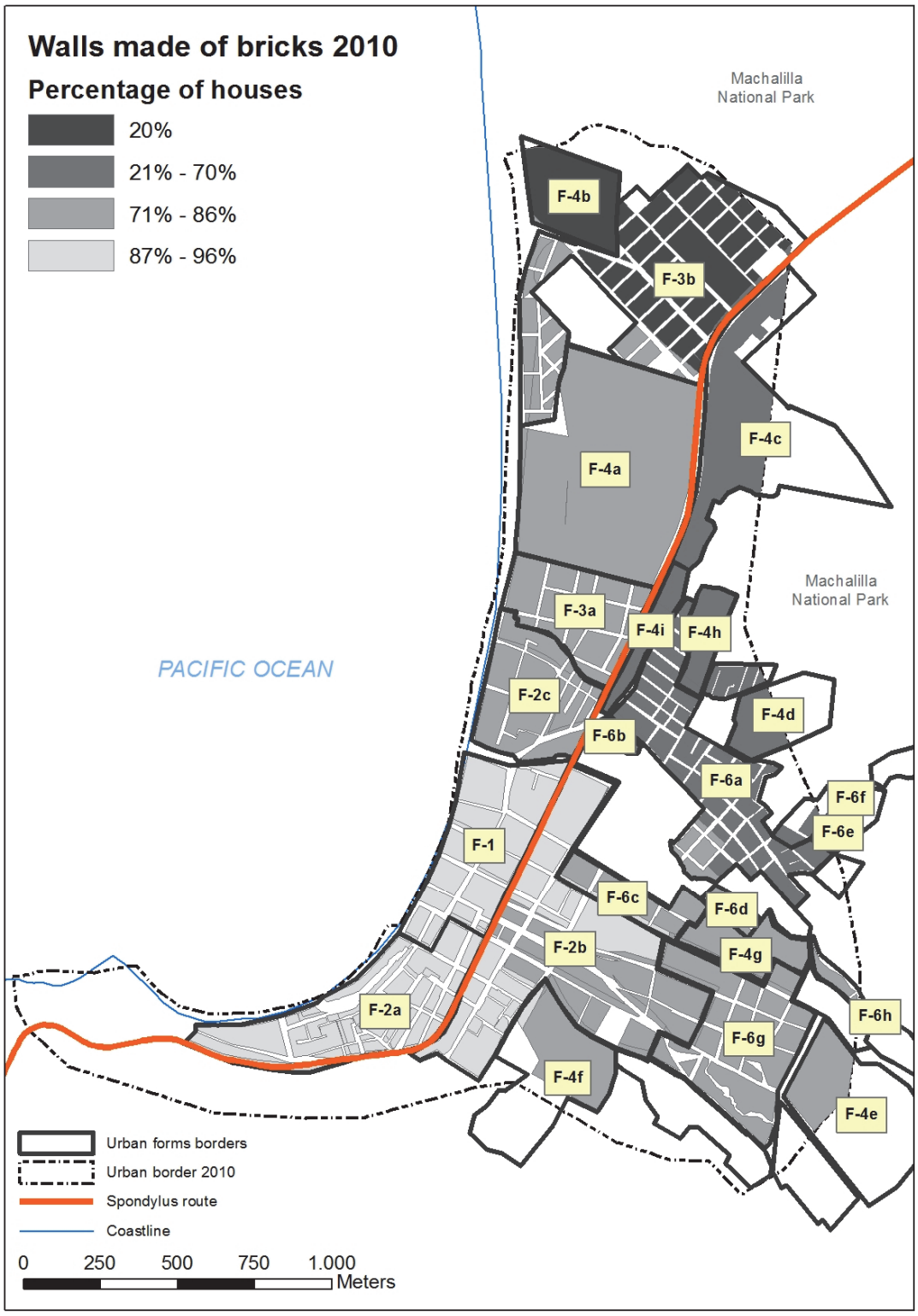


Figure 127: Houses with walls made of cement bricks (Source: Own draft, 2016)

In areas like the downtown and southern fringe belt (F-1, and F-2a) and along the Spondylus Route (F-2b) the percentage of blocks and brick houses was more than 90%. Only in the new growing sectors or expansion areas (F-3b, F-4c, and F-6a), there are still high percentages of houses made of bamboo, wood or others (more than 32%). In the rest of the urban forms, the predominance of concrete and bricks is between 76% and 86%. The expansion areas are

localised at the northern and eastern borders of the town. Informal dwellings are characterised by the use of affordable construction materials like bamboo or wood. In the course of the years, these materials have been replaced by bricks and concrete (Figure 128).

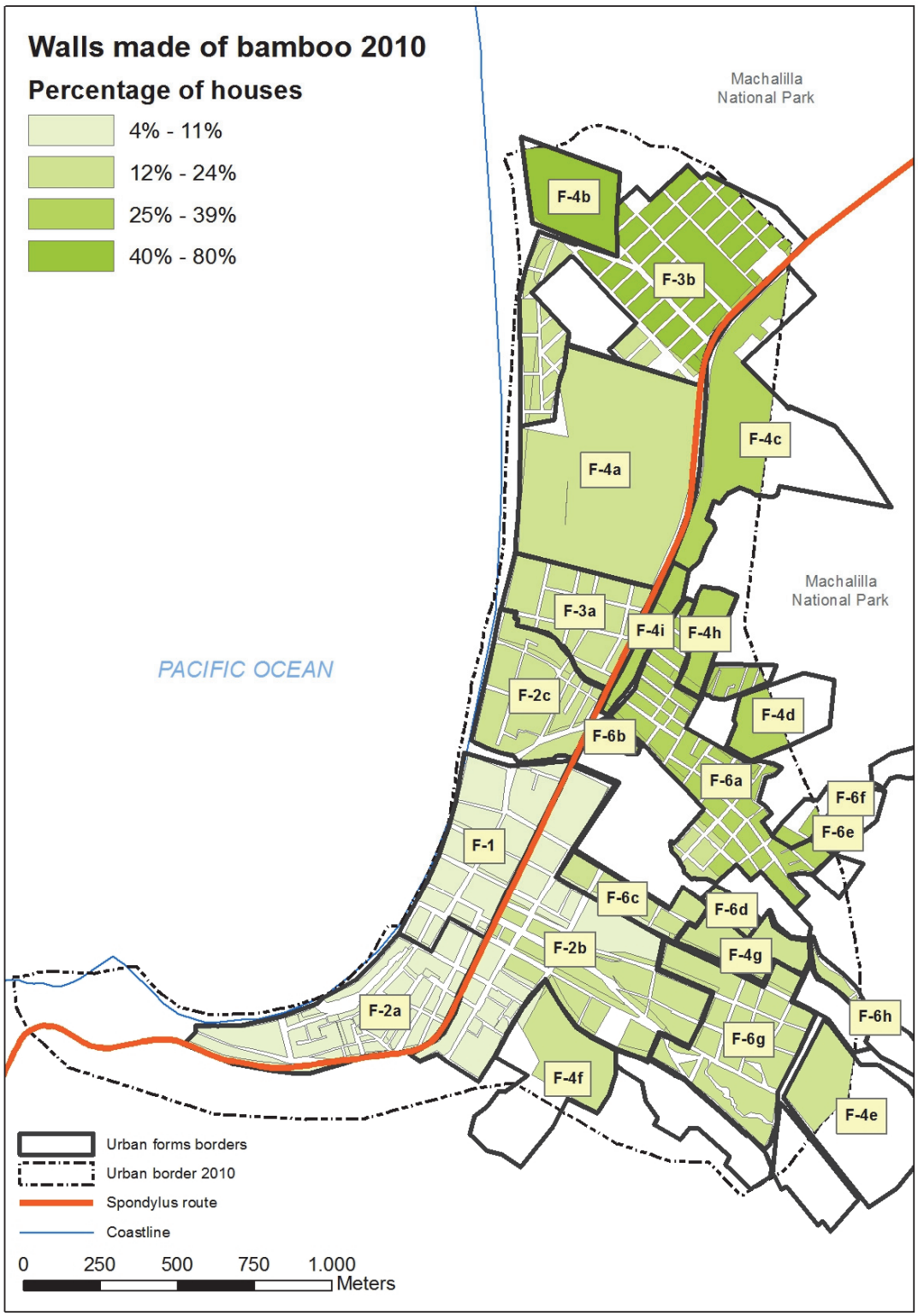


Figure 128: Houses with walls made of bamboo (Source: Own draft, 2016)

7.2.3. Shelter: Promote access to basic services (A4, A5, and A6)

Implementing accessibility to safe water for citizens is still a pending task in Puerto Lopez for local and national governments. Despite the promotion of this town as an international tourist destination, there is no sector within the urban borders where the 100% of houses have access to public piped potable water in 2010. The range is between 8.22% and 80.68%. Additionally, according to citizens the quality of the service is not good. That is why plenty of families have to buy more expensive water from private tanker trucks. In some expansion areas, like the social housing urban form F-3b, there is no piped water network, and 82.88% of the inhabitants depends directly on water tankers (Table 29).

Number	Sectors	Urban forms		Percentage of houses with access to public piped potable water network (2010)	Percentage of houses that buy drinking water to private water trucks (2010)	Percentage of houses that obtain water from a river, channel, well, or rain (2010)
1	Z1-S1	F-3b	F-4b	**8.22%**	**82.88%**	8.90%
2	Z1-S2	F-3a	F-4a	41.86%	46.51%	11.63%
3	Z1-S3	F-2c	F-5b	80.68%	19.32%	0%
4	Z1-S4	F-1	F-5a	79.72%	11.89%	8.39%
5	Z1-S5	F-1	F-5a	**59.82%**	**31.25%**	**8.93%**
6	Z1-S6	F-2a	F-6	**50.00%**	**29.03%**	**20.97%**
7	Z1-S7	F-2a	F-6	46.54%	40.88%	12.58%
8	Z1-S8	F-2a	F-5a	61.27%	21.83%	16.90%
9	Z1-S9	F-2	F-5b	57.14%	7.94%	**34.92%**
10	Z2-S1	F-4c	F-4i, F4h	**36.28%**	**53.98%**	9.73%
11	Z2-S2	F-6a	F-4d, F-5c	59.04%	32.53%	8.43%
12	Z2-S3	F-6a	F-6e, F-6f	66.18%	28.92%	4.90%
13	Z2-S4	F-6c	F-6d, F-4d	74.49%	10.71%	14.80%
14	Z2-S5	F-2b	F-5a	70.70%	10.83%	18.47%
15	Z2-S6	F-6g	F-4e, F-4f	73.10%	8.77%	18.13%
16	Z2-S7	F-2b	F-5a	80.65%	17.20%	2.15%
17	Z2-S8	F-2b	F-5a	81.05%	17.89%	1.05%
18	Z2-S9	F-2b	F-5a	61.21%	27.27%	11.52%

(*) The selected statistical sample was: *private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 29: Access to safe water (2010) (Source: INEC, 2010)

Paradoxically, the access to piped drinking water is also not good in tourist sectors like downtown (F-1 and F-2a) and along the beach. The majority of hotels, hostels, and hosterias have to accumulate water in cisterns or reservoirs or to buy it directly from private tank trucks. It is an enormous informal business has been established due to the scarcity of potable water. Its accessibility for citizens is also a global human right and the most basic service to be provided in a contemporary settlement (Figure 129).

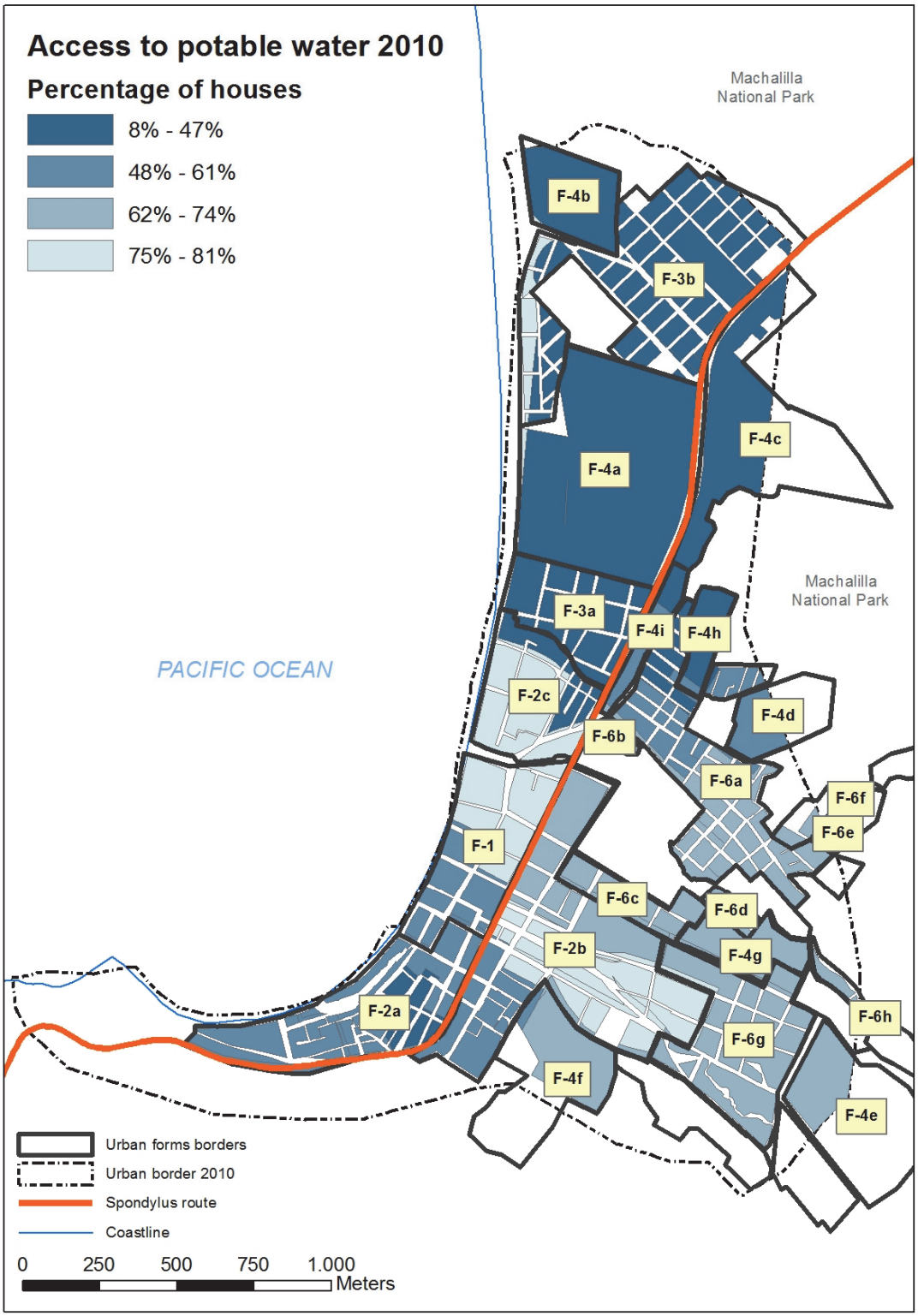


Figure 129: Houses with access to potable piped water (Source: Own draft, 2016)

The lack of access to improved sanitation is probably the most dramatic sign of the extreme conditions of underdevelopment experienced in this town. In 2010, the percentage of houses connected to a public sewage system was marginal (Table 30).

Number	Sectors		Urban forms	Percentage of houses with access to public sewage system (2010)	Percentage of houses connected to a septic tank (2010).	Percentage of houses connected to a latrine (2010).	Percentage of houses without any sewage system (2010).
1	Z1-S1	F-3b	F-4b	**0%**	82.19%	6.16%	**11.64%**
2	Z1-S2	F-3a	F-4a	1.16%	88.37%	2.33%	8.14%
3	Z1-S3	F-2c	F-5b	1.14%	86.36%	2.27%	10.23%
4	Z1-S4	F-1	F-5a	**0%**	89.51%	6.29%	4.20%
5	Z1-S5	F-1	F-5a	**0%**	91.96%	0.89%	7.14%
6	Z1-S6	F-2a	F-6	4.03%	86.29%	4.03%	5.65%
7	Z1-S7	F-2a	F-6	0.63%	72.33%	**13.84%**	**13.21%**
8	Z1-S8	F-2a	F-5a	0.70%	80.28%	**10.56%**	8.45%
9	Z1-S9	F-2	F-5b	0.79%	86.51%	5.56%	7.14%
10	Z2-S1	F-4c	F-4i, F4h	**0%**	87.61%	1.77%	10.62%
11	Z2-S2	F-6a	F-4d, F-5c	**0%**	93.98%	3.61%	2.41%
12	Z2-S3	F-6a	F-6e, F-6f	**0%**	82.35%	4.90%	**12.75%**
13	Z2-S4	F-6c	F-6d, F-4d	0.51%	84.18%	3.57%	**11.73%**
14	Z2-S5	F-2b	F-5a	1.91%	94.27%	0.64%	3.18%
15	Z2-S6	F-6g	F-4e, F-4f	**0%**	81.87%	5.85%	**12.28%**
16	Z2-S7	F-2b	F-5a	**0%**	91.40%	4.30%	4.30%
17	Z2-S8	F-2b	F-5a	**0%**	88.42%	5.26%	6.32%
18	Z2-S9	F-2b	F-5a	**0%**	84.85%	3.64%	11.52%

(*) The selected statistical sample was: *private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 30: Access to improved sanitation (2010) (Source: INEC, 2010)

In the majority of sectors in the peripheries (F-2b, F-3b, F-4, and F-6), and in the tourist downtown, there are no houses with access to the public sewage system. Moreover, the main reason is that there is not a public sewage system in the entire city. Families of Puerto Lopez have been using septic tanks or latrines for several decades. In some sectors where the census identifies between 0.01% and 4.03% of inhabitants with access to the sewage system, there are self-constructed sewage systems which were informally built by inhabitants. The main problem is that the plastic tubes discharge the wastewater into the nearest river, channel, or gorge without any previous technical treatment (Figure 130).

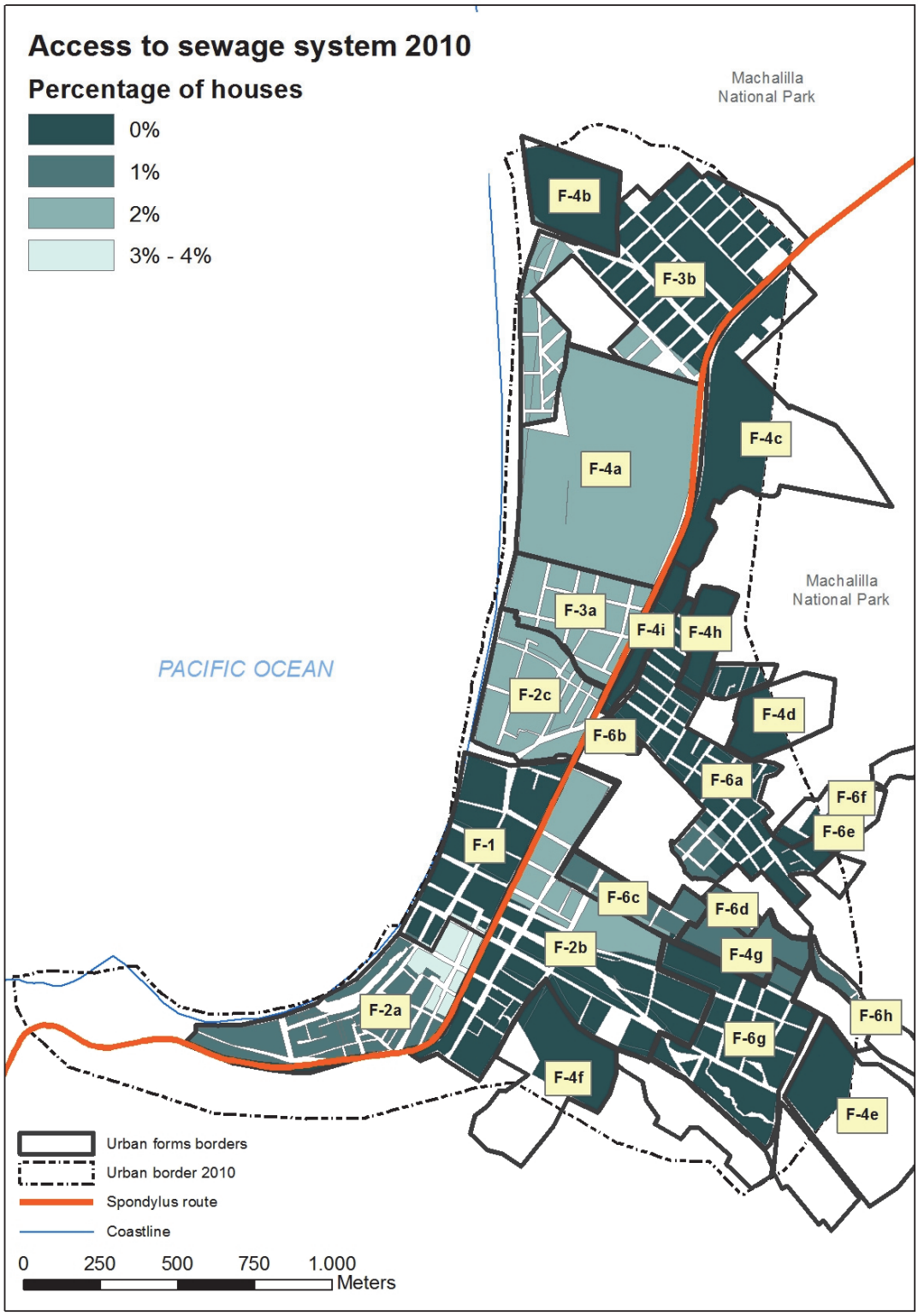


Figure 130: Houses with access to public sewage system (Source: Own draft, 2016)

Likewise, between the 3% and 13% of houses in Puerto Lopez are not connected to any public or private sewage system, which means that there are families who still discharge their sewage water directly into rivers, gorges, or into open spaces. The outcome is the rise of sanitary diseases in low income families that increase social vulnerability (Figure 131).

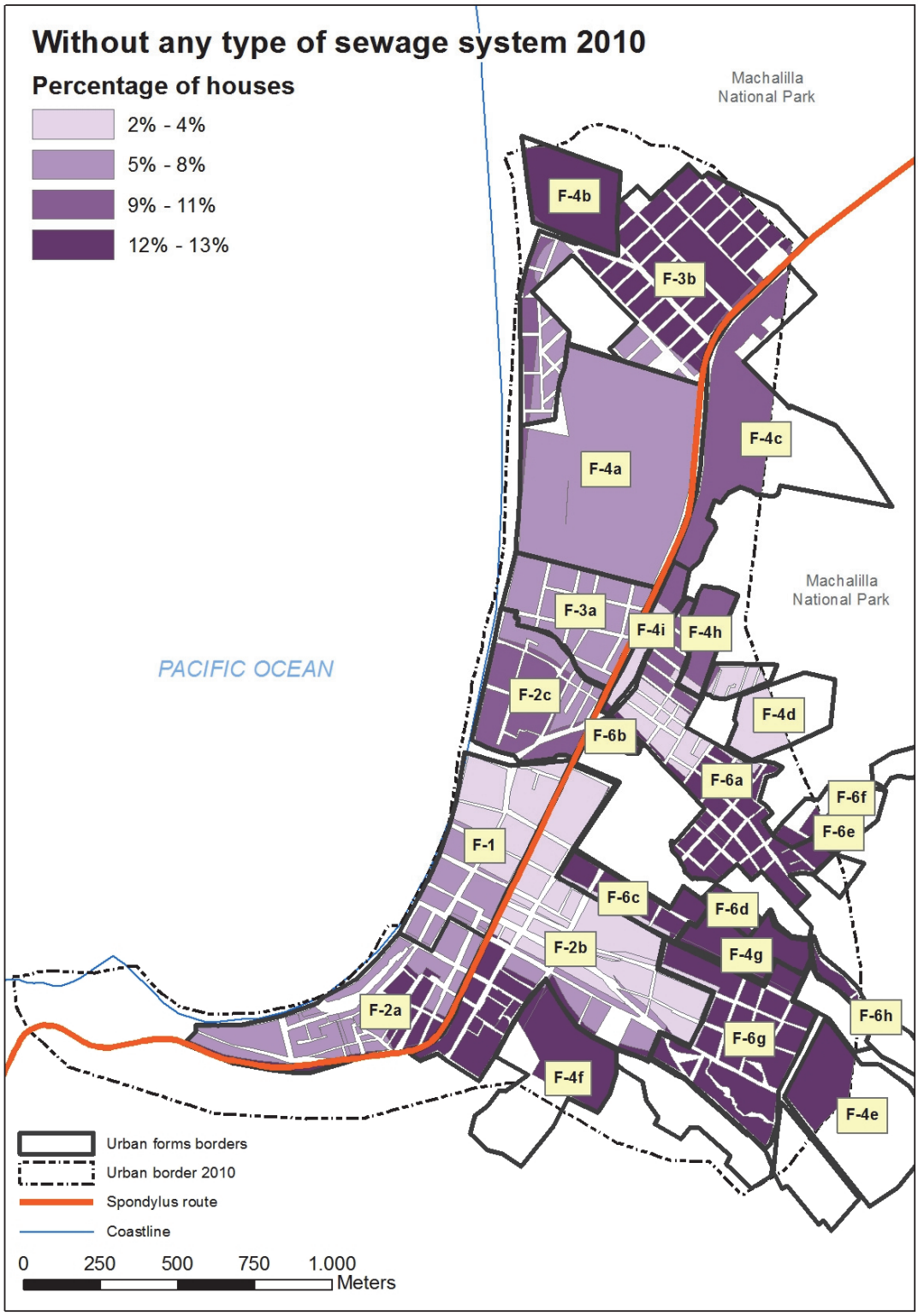


Figure 131: Houses without any sewage system (Source: Own draft, 2016)

Even though the access to electricity service is almost complete, the quality of the service and the informal connections contribute to increasing the levels of exposure, particularly in low income housing areas. Between the 82% and 96% of houses have access to electricity, but there

is also an important percentage of houses connected informally. In peripheral sectors, it can reach the 31.18% (Table 31).

Numbers	Sectors	Urban forms		Percentage of houses with access to public electricity service (2010).	Percentage of houses connected to public electricity service informally (2010).	Percentage of houses with access to garbage collection service (2010).	Percentages of houses that burn, bury, or throw in fallow land or gorges (2010).
1	Z1-S1	F-3b	F-4b	83.56%	**25.41%**	94.52%	**5.48%**
2	Z1-S2	F-3a	F-4a	94.19%	12.35%	98.84%	1.16%
3	Z1-S3	F-2c	F-5b	90.91%	**18.75%**	100%	0%
4	Z1-S4	F-1	F-5a	92.31%	6.82%	97.90%	2.10%
5	Z1-S5	F-1	F-5a	91.96%	7.77%	98.21%	1.79%
6	Z1-S6	F-2a	F-6	93.55%	13.79%	98.39%	1.61%
7	Z1-S7	F-2a	F-6	94.34%	14.67%	99.37%	0.63%
8	Z1-S8	F-2a	F-5a	91.55%	12.31%	100%	0%
9	Z1-S9	F-2	F-5b	99.21%	15.20%	99.21%	0.79%
10	Z2-S1	F-4c	F-4i, F4h	82.30%	**31.18%**	92.04%	**7.96%**
11	Z2-S2	F-6a	F-4d, F-5c	86.75%	13.89%	96.39%	3.61%
12	Z2-S3	F-6a	F-6e, F-6f	79.90%	17.79%	95.10%	**4.90%**
13	Z2-S4	F-6c	F-6d, F-4d	91.33%	17.32%	96.43%	3.57%
14	Z2-S5	F-2b	F-5a	96.18%	12.58%	99.36%	0.64%
15	Z2-S6	F-6g	F-4e, F-4f	90.64%	12.90%	95.32%	**4.68%**
16	Z2-S7	F-2b	F-5a	93.55%	**19.54%**	98.92%	1.08%
17	Z2-S8	F-2b	F-5a	84.21%	8.75%	100%	0%
18	Z2-S9	F-2b	F-5a	95.76%	9.49%	98.79%	1.21%

(*) The selected statistical sample was: *private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 31: Connection to public services (2010) (Source: INEC, 2010)

It is not a new phenomenon in towns and cities of the developing world. However, clandestine connections to electricity service increase the levels of exposure to fire disasters in sectors where houses are made of wood, bamboo or other inflammable materials. The new expansion areas, F-3b, F-2c, F-4c, and F-2b, which are predominantly low income neighbourhoods, contain this dangerous combination: high percentage houses made of bamboo or wood, and plenty of houses connected informally to the electricity power network (Figure 132).

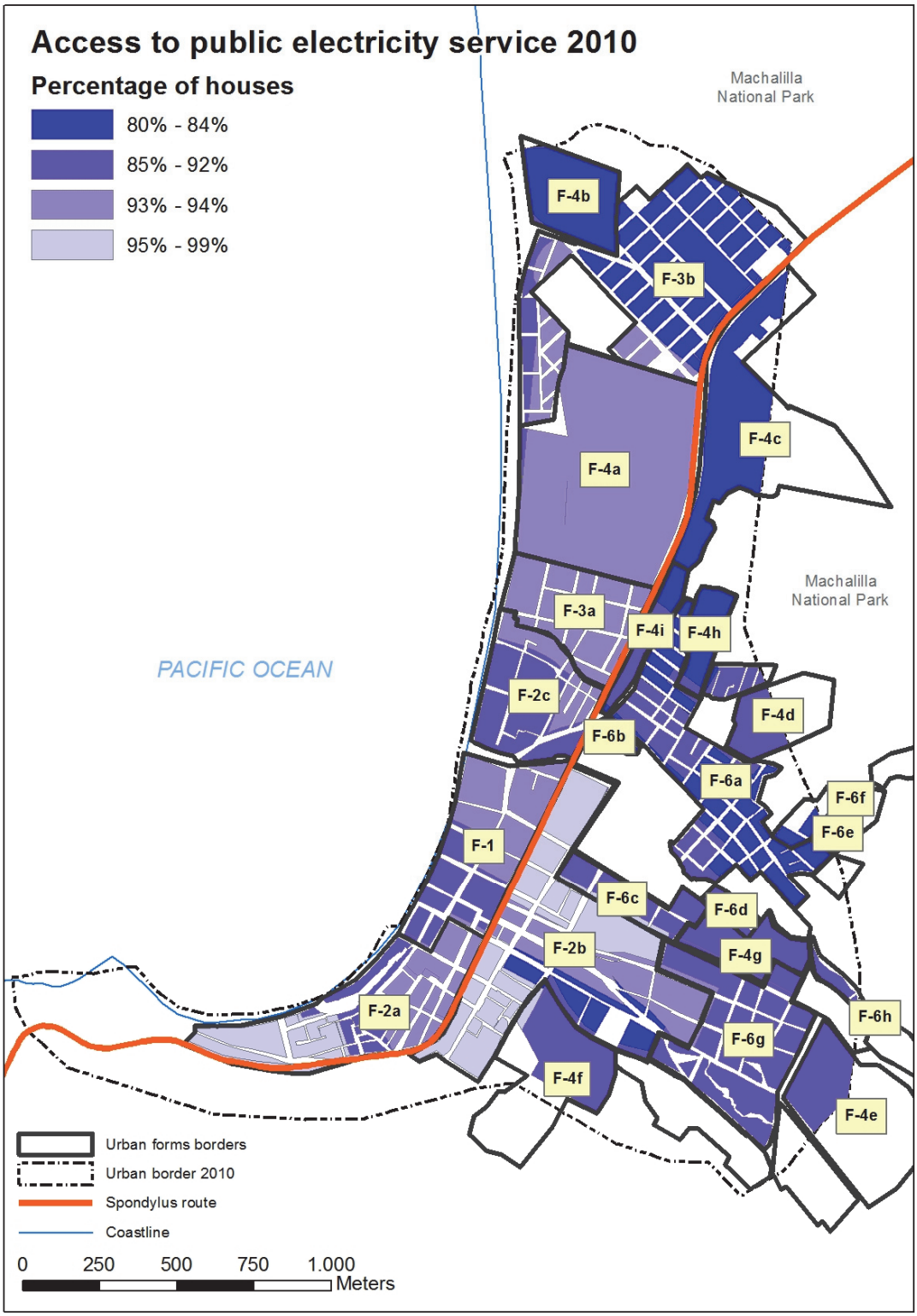


Figure 132: Houses with access to public electricity service (Source: Own draft, 2016)

In 2010, the majority of houses in all sectors had access to a garbage collection service (92% - 100%). However, there are other areas where families still burn, bury or throw solid wastes into the open spaces, rivers or gorges. In the northern and eastern urban borders (F-3b, and F-6), close to the Machalilla National Park, there are the highest levels: 4.90% - 7.96% (Figure 133).

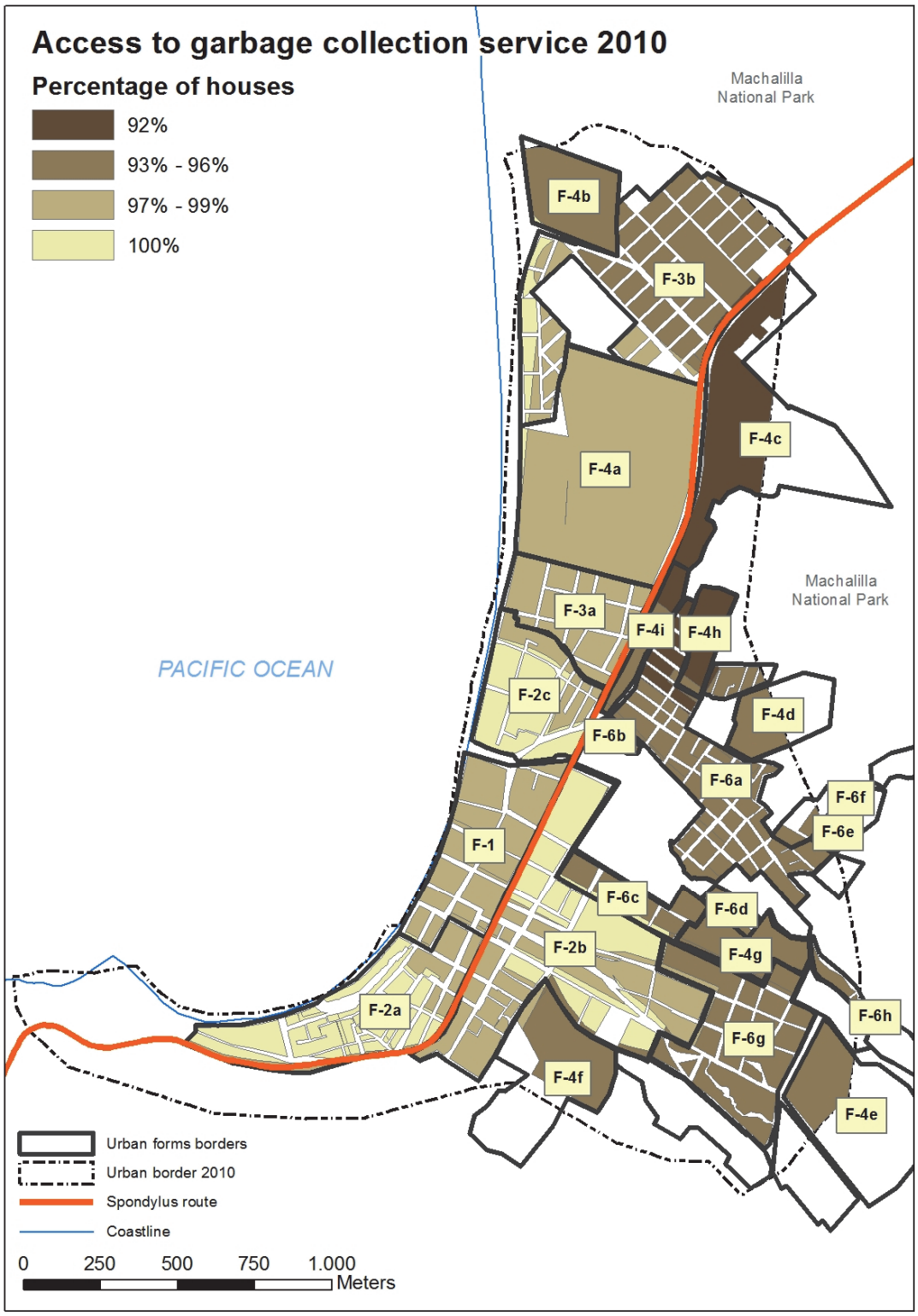


Figure 133: Houses with access to garbage collection service (Source: Own draft, 2016)

This situation represents an important and direct impact on the natural environment, primarily to the endangered species that still survive in the national park. Burning solid wastes in open spaces produce pollution by CO_2 and toxic gases (Figure 134).

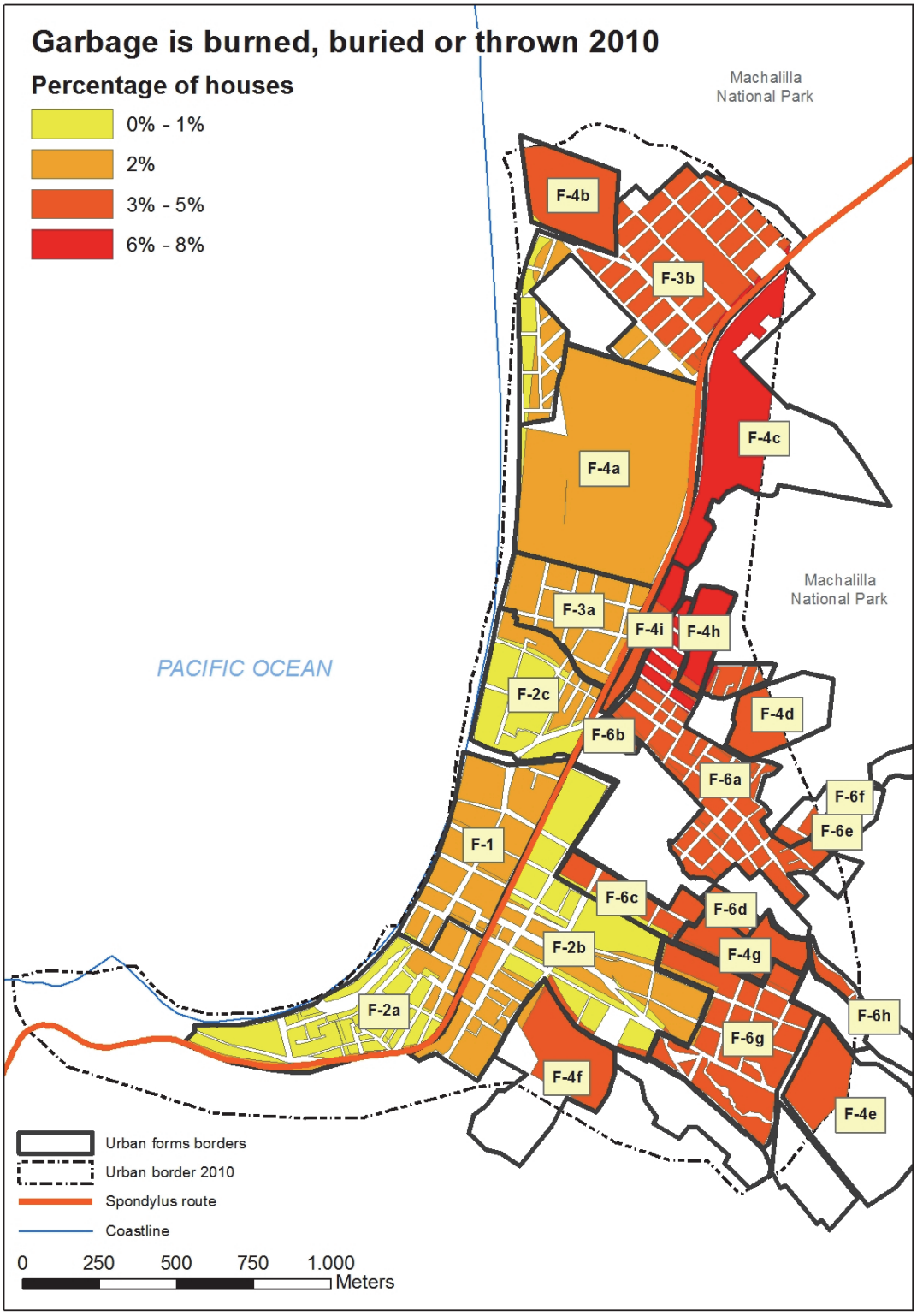


Figure 134: Houses where garbage is burned, buried, or thrown (Source: Own draft, 2016)

Likewise, burying garbage without a technical process is a medium and long-term problem due to the filtration of landfill leachates by the permeating of surface water. In some areas, where

toxic liquids mix with groundwater bodies, the informal burying of garbage represents a sanitary crisis. Particularly, it directly affects families who still consume water from wells, rivers or *albarradas.*

According to the last national census, in the urban area of Puerto Lopez, there are sectors like F-2, where the percentages of inhabitants that still consume water directly water bodies can reach the 35% (Table 29). These natural sources of water have been used for centuries in rural areas of the coastal region before the arrival of modern urbanisation, but nowadays the same process of urbanisation has transformed it into a sanitary problem.

7.2.4. Promote social integration and support disadvantaged groups (A9 and A10)

For the last two decades (1990-2001, 2001-2010), the percentage of homes living in poverty (Basic Unsatisfied Needs index) have been high and the decrease extremely marginal in all sectors. Despite that Ecuador addressed to reduce this variable from 84.3% in 1990 to 60.1% in 2010, towns like Puerto Lopez still have 88.60% of homes living in poverty in 2010. In Puerto Lopez, the decrease of poverty was only -8.71% during the last twenty years, while, on the national scale, it was almost three times less, -24.2% (Table 32).

Number	Sectors	Urban forms		Percentage of homes living in poverty (**) 1990	Percentage of homes living in poverty (**) 2001	Percentage of homes living in poverty (**) 2010	Percentage variation 1990-2001	Percentage variation 2001-2010
1	Z1-S1	F-3b	F-4b	-	95.65%	97.30%	-	+1.65%
2	Z1-S2	F-3a	F-4a	-	95.65%	83.91%	-	-11.74%
3	Z1-S3	F-2c	F-5b	100%	95.65%	89.36%	-4.35%	-6.29%
4	Z1-S4	F-1	F-5a	100%	89.66%	78.38%	-10.34%	-11.28%
5	Z1-S5	F-1	F-5a	83.47%	93.69%	72.65%	**+10.22%**	-21.04%
6	Z1-S6	F-2a	F-6	100%	93.14%	86.82%	-6.86%	-6.32%
7	Z1-S7	F-2a	F-6	98.41%	96.83%	94.01%	-1.58%	-2.82%
8	Z1-S8	F-2a	F-5a	98.41%	100%	88.59%	**+1.59%**	-11.41%
9	Z1-S9	F-2	F-5b	100%	100%	93.23%	**0%**	-6.77%
10	Z2-S1	F-4c	F-4i, F4h	-	100%	91.45%	-	-8.55%
11	Z2-S2	F-6a	F-4d, F-5c	-	100%	86.21%	-	-13.79%
12	Z2-S3	F-6a	F-6e, F-6f	100%	97.50%	95.69%	-2.50%	-1.81%
13	Z2-S4	F-6c	F-6d, F-4d	100%	97.50%	93.47%	-2.50%	-4.03%
14	Z2-S5	F-2b	F-5a	100%	92.80%	80.63%	-7.20%	-12.17%
15	Z2-S6	F-6g	F-4e, F-4f	-	98.35%	92.70%	-	-5.65%
16	Z2-S7	F-2b	F-5a	-	99.19%	84.21%	-	-14.98%
17	Z2-S8	F-2b	F-5a	-	99.19%	84.38%	-	-14.81%
18	Z2-S9	F-2b	F-5a	-	95.80%	88.24%	-	-7.56%
Total				97.31%	96.57%	88.60%	**-0.74%**	-7.97%
National scale				84.30%	69.30%	60.10%	**-15%**	-9.20%

(**) The selected statistical sample was: *homes living in private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 32: Poor households, the evolution of poverty 1990-2010 (Source: INEC, 2010)

In other words, 9 of every ten homes still live in poverty in the majority of neighbourhoods of Puerto Lopez in 2010. Despite the announced and promoted spreading of social and economic development due to the arrival of domestic and international tourism, poverty is still there, and there is not a clear perspective of changing this situation (Figure 135).

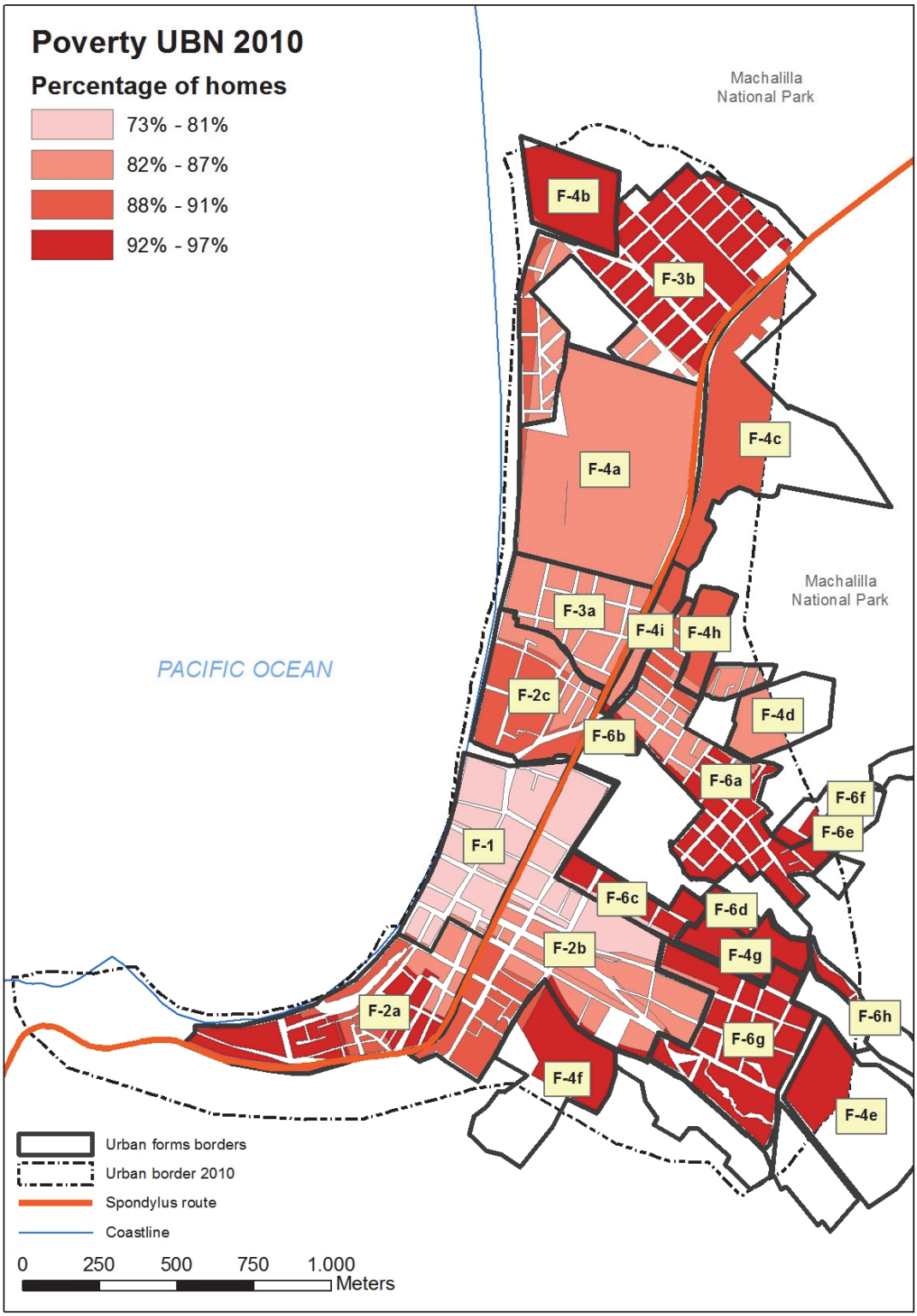


Figure 135: Percentage of inhabitants living in poverty (UBN) (Source: Own draft, 2016)

By contrast, illiteracy has been decreasing substantially for the last decade (2001-2010) in all sectors, even more than the national illiteracy rate (6.8%). Due to the popularisation of national policies focused on increasing the accessibility of population to basic education by the massive construction of schools in rural and urban areas, more children have been able to attend the primary school. They learnt to read and write, but many of them do not continue their studies to help at home by informal jobs related to tourism, retailing, farming or fishing (Table 33).

Number	Sectors	Urban forms		Illiteracy rate (1990)	Illiteracy rate (2001)	Illiteracy rate (2010)	Percentage variation 1990-2001	Percentage variation 2001-2010
1	Z1-S1	F-3b	F-4b	-	14.25%	7.24%	-	-7.01%
2	Z1-S2	F-3a	F-4a	-	14.25%	5.04%	-	-9.21%
3	Z1-S3	F-2c	F-5b	15.74%	14.25%	7.72%	-1.49%	-6.53%
4	Z1-S4	F-1	F-5a	9.53%	6.29%	5.16%	-3.24%	**-1.13%**
5	Z1-S5	F-1	F-5a	10.08%	6.28%	5.04%	-3.80%	-1.24%
6	Z1-S6	F-2a	F-6	11.25%	8.76%	9.14%	-2.49%	**0.38%**
7	Z1-S7	F-2a	F-6	16.62%	18.25%	9%	1.63%	-9.25%
8	Z1-S8	F-2a	F-5a	16.62%	17.99%	10.65%	1.37%	-7.34%
9	Z1-S9	F-2	F-5b	15.06%	11.53%	9.37%	-3.53%	-2.16%
10	Z2-S1	F-4c	F-4i, F4h	-	19.55%	11.65%	-	-7.90%
11	Z2-S2	F-6a	F-4d, F-5c	-	22.10%	8.67%	-	**-13.43%**
12	Z2-S3	F-6a	F-6e, F-6f	15.74%	20.88%	10.66%	5.14%	-10.22%
13	Z2-S4	F-6c	F-6d, F-4d	27.68%	20.88%	12.08%	-6.80%	-8.80%
14	Z2-S5	F-2b	F-5a	27.68%	18.29%	10.95%	-9.39%	-7.34%
15	Z2-S6	F-6g	F-4e, F-4f	-	21.69%	15.81%	-	-5.88%
16	Z2-S7	F-2b	F-5a	-	20.19%	13.66%	-	-6.53%
17	Z2-S8	F-2b	F-5a	-	20.19%	10.66%	-	-9.53%
18	Z2-S9	F-2b	F-5a	-	14.21%	6.30%	-	-7.91%
Total				15.26%	15.92%	9.48%	**-0.66%**	**-6.44%**
National scale				11.70%	9%	6.80%	**-2.70%**	**-2.20%**

(**) The selected statistical sample was: *homes living in private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 33: Percentage of illiterate population 1990 - 2010 (Source: INEC, 2010)

In 2010, the highest levels of illiteracy were in the eastern low income housing expansion areas (F-6), and in the old fishing settlement of La Ensenada (F-2b). Both have been recipient areas of regional rural migrants that settled in Puerto Lopez to find a better job and life (Figure 136).

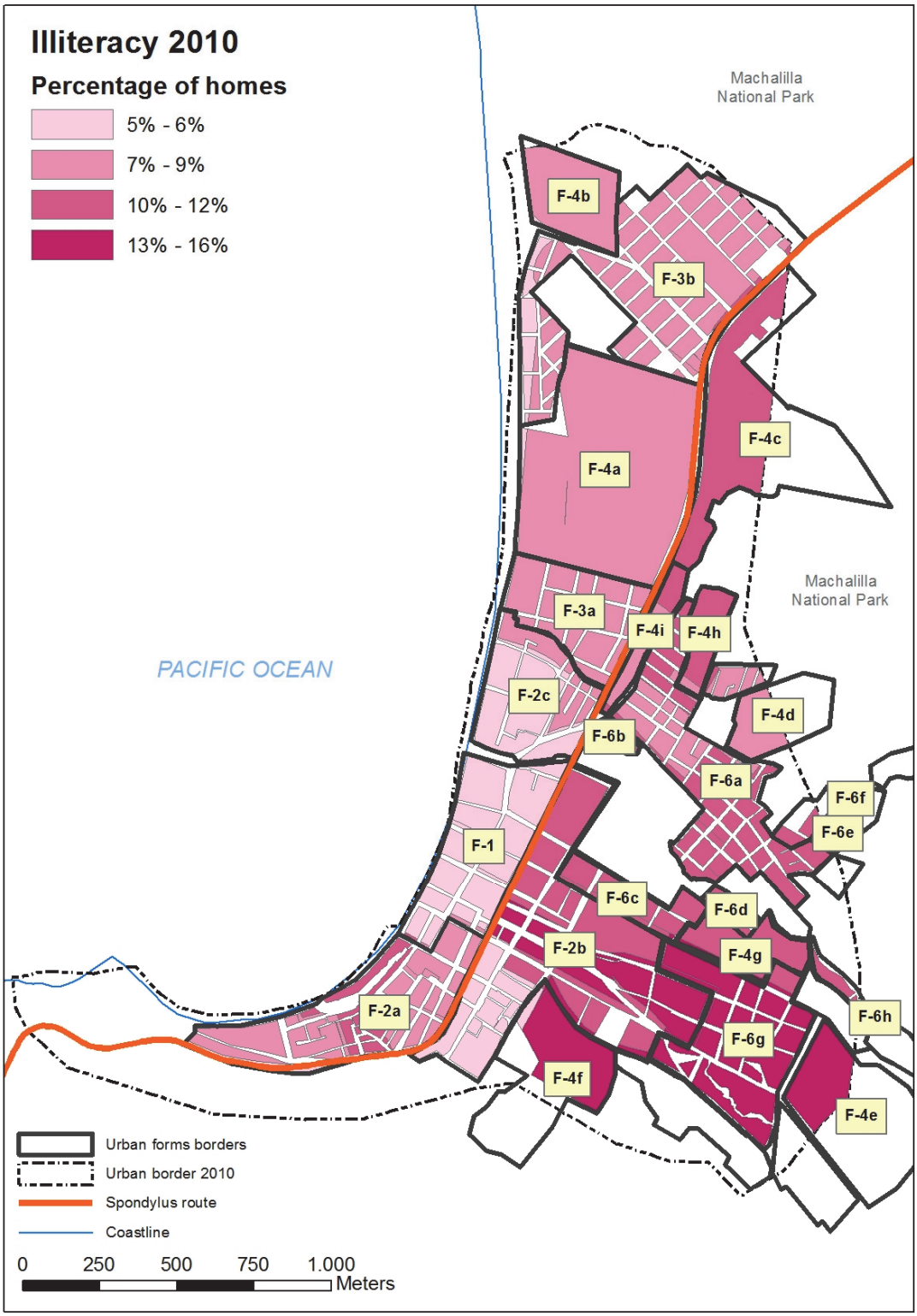


Figure 136: Percentage of illiterate inhabitants (Source: Own draft, 2016)

7.2.5. Promote geographically balanced settlement structures (A11)

Population growth has been the main trigger of urban growth in Puerto Lopez. While the annual intercensal rates of population growth for the periods 1990-2001 and 2001-2010 were 2.05% and 1.95% respectively in Ecuador, in the town of Puerto Lopez (urban area), the increase reached a 3.6% and 2.73%. Between 1990 and 2001 the number of inhabitants increased by 36.03%, and after nine years (2010) had risen by 24.64% (Table 34).

Number	Sectors	Urban forms		Population (***) 1990	Population (***) 2001	Population (***) 2010	Percentage of population (***) 1990	Percentage of population (***) 2001	Percentage of population (***) 2010	Percentage variation of population 2001 – 2010
1	Z1-S1	F-3b	F-4b	-	215	524	-	2.79%	5.32%	2.53%
2	Z1-S2	F-3a	F-4a	-	215	352	-	2.79%	3.57%	0.78%
3	Z1-S3	F-2c	F-5b	319	215	393	5.62%	2.79%	3.99%	1.20%
4	Z1-S4	F-1	F-5a	771	503	580	13.59%	6.52%	5.89%	-0.63%
5	Z1-S5	F-1	F-5a	656	506	498	11.56%	6.55%	5.05%	-1.50%
6	Z1-S6	F-2a	F-6	927	505	526	16.33%	6.54%	5.34%	-1.20%
7	Z1-S7	F-2a	F-6	330	605	746	5.81%	7.84%	**7.57%**	-0.27%
8	Z1-S8	F-2a	F-5a	330	540	593	5.81%	6.99%	6.02%	-0.98%
9	Z1-S9	F-2	F-5b	675	441	538	11.89%	5.71%	5.46%	-0.25%
10	Z2-S1	F-4c	F-4i, F4h	-	491	436	-	6.36%	4.42%	-1.94%
11	Z2-S2	F-6a	F-4d, F-5c	-	594	307	-	7.69%	**3.12%**	**-4.58%**
12	Z2-S3	F-6a	F-6e, F-6f	319	289	881	5.62%	3.74%	**8.94%**	**5.20%**
13	Z2-S4	F-6c	F-6d, F-4d	329	289	778	5.80%	3.74%	**7.90%**	**4.16%**
14	Z2-S5	F-2b	F-5a	329	569	577	5.80%	7.37%	5.86%	-1.51%
15	Z2-S6	F-6g	F-4e, F-4f	-	562	679	-	7.28%	6.89%	-0.39%
16	Z2-S7	F-2b	F-5a	-	295	346	-	3.81%	3.51%	-0.30%
17	Z2-S8	F-2b	F-5a	-	295	380	-	3.81%	3.86%	0.04%
18	Z2-S9	F-2b	F-5a	-	592	720	-	7.67%	**7.31%**	-0.36%
Total				**5,675**	**7,720**	**9,854**	**87.82%**	**100%**	**100%**	**+27.6%**
National scale				**9.6 million**	**12.1 million**	**14.4 million**				**+1.95%**

(***) The selected statistical sample was: *homes living in private individual occupied the house with present inhabitants in the moment of the census visit.* Not occupied or abandoned houses, corporate houses or buildings, or houses under construction were not considered in the sample.

Table 34: Evolution of the quantity of population 1990-2010 (Source: INEC, 2010)

The shrinking and increasing of the people in each sector during both intercensal periods allows observing the dynamic flows of new and old inhabitants. In the following graphic, the percentage of population per sector is shown in detail for years 1990, 2001, and 2010. While the old neighbourhoods localised in downtown and at the south and north part of the beach (F-1, and F-2a) concentrated the major percentage of the total population in 1990, in 2010 the distribution of inhabitants is more homogenous (Figure 137).

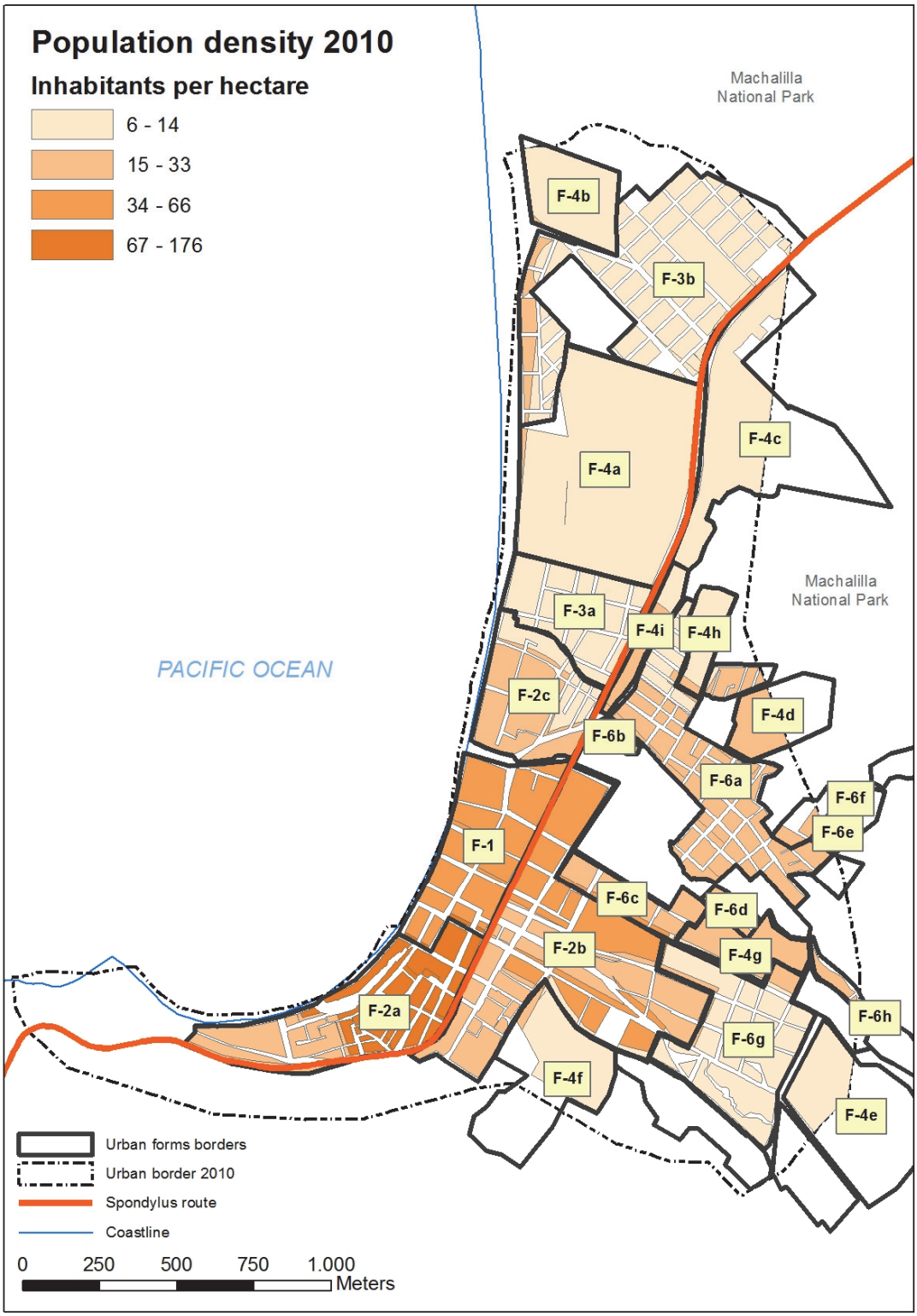


Figure 137: Population density in 2010 (Source: Own draft, 2016)

This rapid population growth is the result of regional migration coming from neighbouring coastal cantons and even from other regions of the country. The evidence is clearly visible by observing statistical data. Regarding unemployment, the highest percentages (59%-62%) of unemployed inhabitants are located in the southern and northern fringe belt (F-2a and F-2c) and

in the eastern expansion areas (F-4 and F-6). The latter are neighbourhoods that were predominantly densified and settled by migration. In the case of F-2a and F-2b, more than the 80% of inhabitants were living in these neighbourhoods for the last five years (Figure 138).

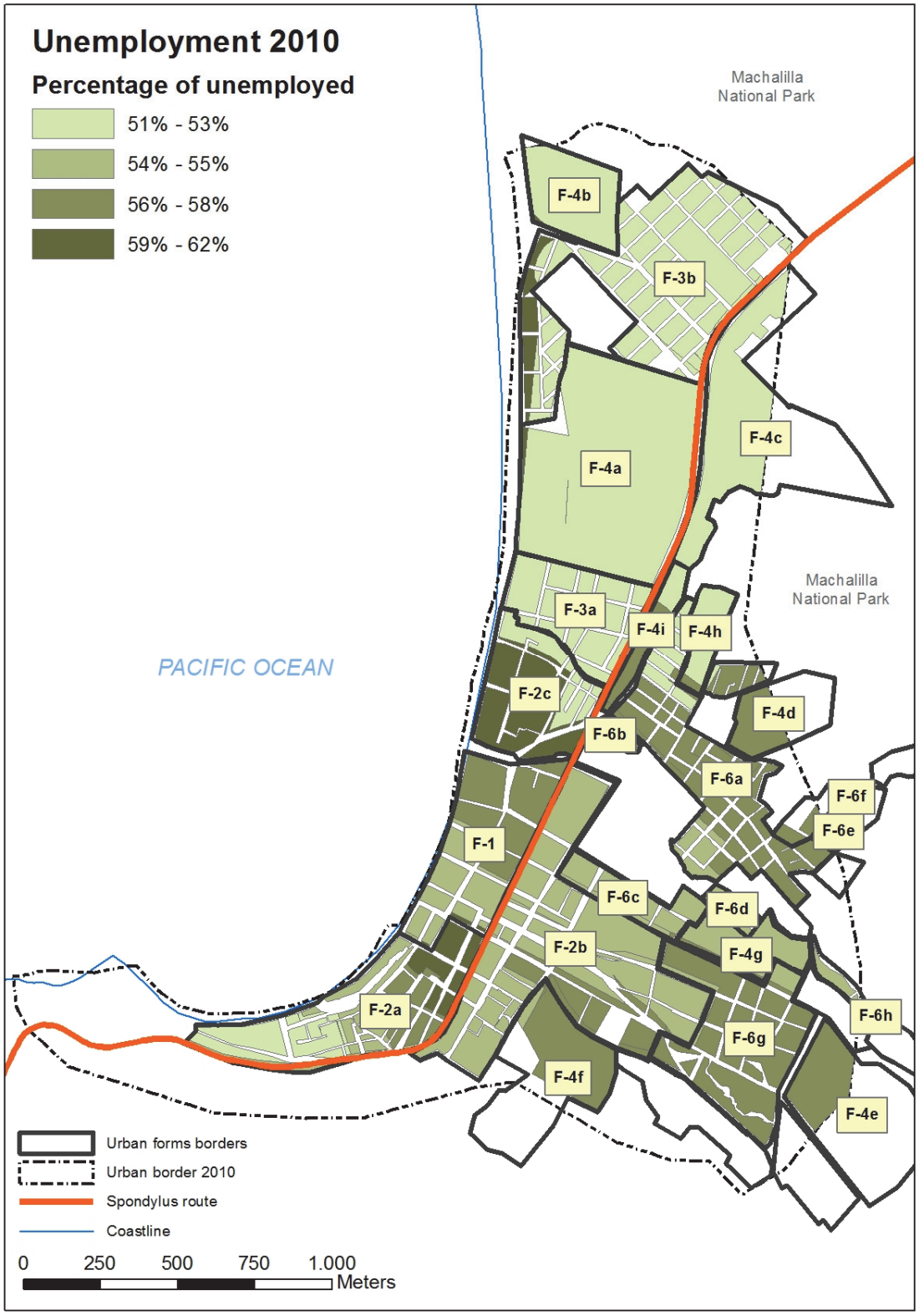


Figure 138: Percentage of unemployed inhabitants (Source: Own draft, 2016)

In 2010, just 63.85% (6,292) of the inhabitants of the canton Puerto Lopez had been born in the same canton, 34.91% (3,440) in other cantons of the country, and 1.22% (120) has been born in other countries of America, Europe, and Oceania (Table 36).

The quantity of population according to the place of residence five years before the census (2010)												
Sector	Urban forms		In this city or other rural Parroquia.	In another place of the country	In another country	Still not born	Total	In this city or other rural Parroquia (%).	In another place of the country (%).	In another country (%).	Still not born (%).	Total
Z1-S1	F-3b	F-4b	328	104	0	92	524	62.60%	**19.85%**	0%	**17.56%**	100%
Z1-S2	F-3a	F-4a	256	42	21	33	352	72.73%	**11.93%**	**5.97%**	**9.38%**	100%
Z1-S3	F-2c	F-5b	320	23	1	49	393	81.42%	5.85%	0.25%	12.47%	100%
Z1-S4	F-1	F-5a	447	51	24	58	580	77.07%	8.79%	4.14%	10%	100%
Z1-S5	F-1	F-5a	378	52	23	45	498	75.90%	**10.44%**	**4.62%**	**9.04%**	100%
Z1-S6	F-2a	F-6	435	32	8	51	526	82.70%	6.08%	1.52%	9.70%	100%
Z1-S7	F-2a	F-6	623	28	2	93	746	83.51%	3.75%	0.27%	12.47%	100%
Z1-S8	F-2a	F-5a	490	40	7	56	593	82.63%	6.75%	1.18%	9.44%	100%
Z1-S9	F-2	F-5b	447	18	4	69	538	83.09%	3.35%	0.74%	12.83%	100%
Z2-S1	F-4c	F-4i, F4h	330	47	4	55	436	75.69%	**10.78%**	0.92%	**12.61%**	100%
Z2-S2	F-6a	F-4d, F-5c	241	27	6	33	307	78.50%	**8.79%**	1.95%	10.75%	100%
Z2-S3	F-6a	F-6e, F-6f	653	93	0	135	881	74.12%	**10.56%**	0%	**15.32%**	100%
Z2-S4	F-6c	F-6d, F-4d	661	32	0	85	778	84.96%	4.11%	0%	10.93%	100%
Z2-S5	F-2b	F-5a	497	17	1	62	577	86.14%	2.95%	0.17%	10.75%	100%
Z2-S6	F-6g	F-4e, F-4f	575	27	0	77	679	84.68%	3.98%	0%	11.34%	100%
Z2-S7	F-2b	F-5a	288	9	5	44	346	83.24%	2.60%	1.45%	12.72%	100%
Z2-S8	F-2b	F-5a	311	25	0	44	380	81.84%	6.58%	0%	11.58%	100%
Z2-S9	F-2b	F-5a	574	35	5	106	720	79.72%	4.86%	0.69%	14.72%	100%
TOTAL			7,854	702	111	1,187	9,854	79.70%	7.12%	1.13%	12.05%	100%

Table 35: Population according to the place of residence five years ago (2010) (Source: INEC, 2010)

The allocation of regional immigrants in the sectors can be observed by the demographic variable "Quantity of the population according to the place of residence five years before the census (2005)". It detailed the amount of population that was residing in the town of Puerto Lopez, or in another place (canton or country) five years ago. From a total amount of 9,854 inhabitants living in the urban area of Puerto Lopez, 79.70% (7,854) had been residing inside

the urban area five years ago (since 2005), 7.12% (702) in other places of the country, 1.13% (111) in another country.

However, 12.05% (1,187) had not been born yet. The distribution per sectors of old and new (5 years) residents is almost equal. Nevertheless, it is interesting to observe that in new urban growth areas localised at the northern (F-3b and F-4c) and the eastern border, (F-6), as well as in the intensively densified downtown area (F-1), the number of new residents is higher. In the northern expansion zone, where a social housing project is localised (F-3b), 19.85% of the inhabitants had not been residing in the town five years ago, and 17.56% was not born yet in 2005.

7.3. Comparing sustainability between the urban forms

By summarising and comparing the main features of the six urban forms (2010), similarities and differences between them were identified. The dissection in parts or urban forms of the current urban area (2010) of Puerto Lopez, contributes to clarify an objective understanding of the impact of the urban growth on the natural and built environment. The characterisation and measuring of the sustainability and resilience of each urban form allow observing individual responsibilities in the processes of construction, destruction and reconstruction of the physical and social space, which is part of the dynamics that characterises the relation between current urban systems, urbanisation, and globalisation (Figure 139).

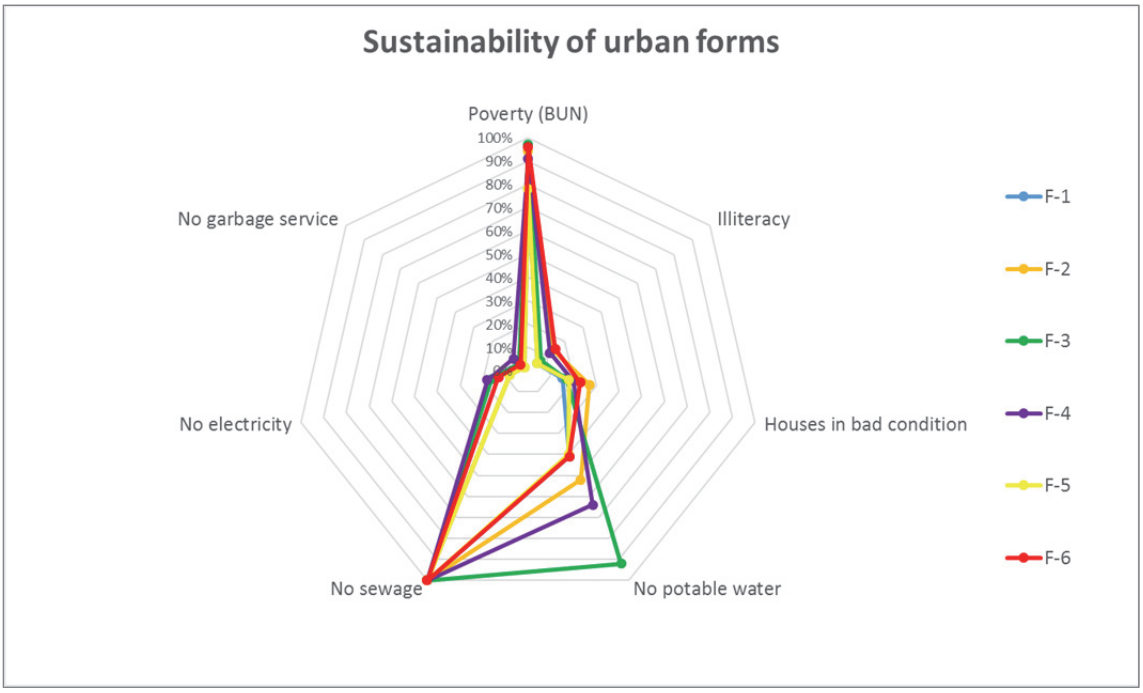


Figure 139: Sustainability of urban forms (Source: Own draft, 2016)

Despite the observable advances regarding illiteracy, and provision of services like electricity, and collection of solid wastes, the urban forms contain high percentages of poverty, and lack of potable water and sewage system. These deficits have contributed to increasing significantly the levels of exposure to natural disasters and economic crisis. Likewise, the location of tourism services of accommodation or leisure activities in downtown or along the Spondylus did not produce a positive effect regarding improving the basic services. Self-provision solutions solved the lack of piped potable water and a public sewage system. However, the high costs of implementation turned these options into an unaffordable luxury for low income families (Figure 140).

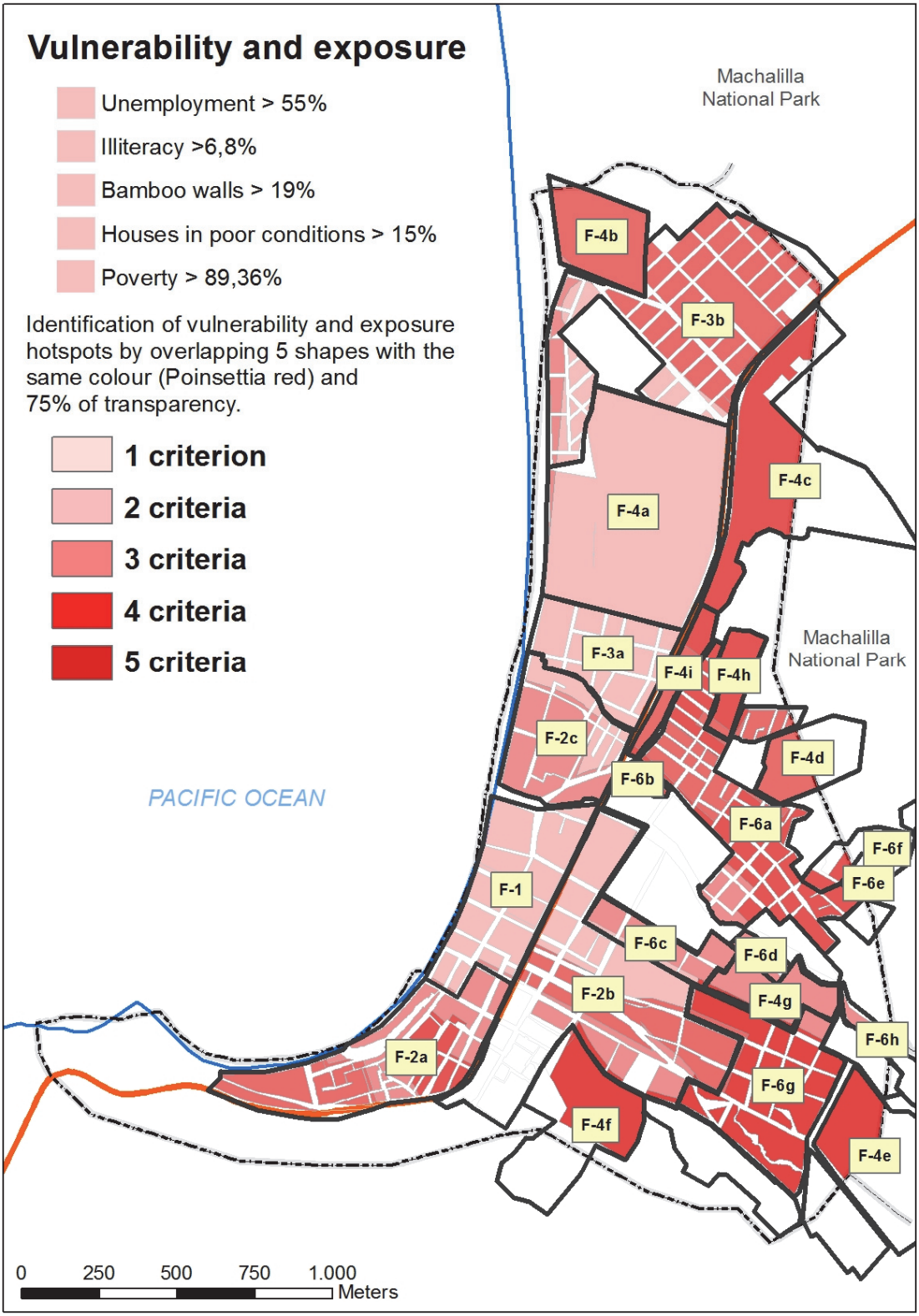


Figure 140: Multivariate map, overlapping vulnerability and exposure (Source: Own draft, 2016)

This inequality in the access to basic infrastructure is observable on the differences between the tourism services provided by formal and informal private tourist infrastructure. Due to the lack of economic resources to afford the technology to replace the deficit of basic public services, the quality of the offer of low income investors cannot compete with the globalised tourist

industry. The quality of the housing construction is also a major problem not easy to observe by statistics. Regardless the replacement of traditional building materials with more durable like bricks and concrete, the informal practice of self-construction transformed concrete houses in a dangerous shelter in case of natural disasters. This reality could be observed during a powerful earthquake that hit the northern coastal region of Ecuador in April 2016. The majority of destroyed buildings were made of bricks and concrete. The lack of control on the private construction and the irresponsibility of informal builders cost the lives of more than 650 persons.

The predominance of low-density housing in the fringe belt and peripheries is an important challenge to be addressed by urban planners. The urban growth of Puerto Lopez will continue expanding to the northern and eastern flanks, which also means the exponential rise of the ecological footprint. The demand for new affordable land by new inhabitants, visitors and foreign tourist investors will press the urban borders of Puerto Lopez continuously. In 2010, there is still not occupied territory inside the urban area. Macro plots and social housing have free land ready to be urbanised. However, the tourist boom has transformed the local land and real estate market in Puerto Lopez. Macro plots have appreciated significantly for the last decade, especially due to the demand of them for the construction of hotels, hosterias, and other tourism services. If this request rises again, these terrains will be settled by the distinct type of private infrastructure. New regional migrants, new generations, and visitors will have to find secondary options to settle near job opportunities.

7.4. Analysis of correlations between main variables

The Spearman's rank correlation coefficient (SRCC) was applied to identify possible correlations between the demographic variables described for the year 2010. The following quotation explains its definition and key features briefly:

> In statistics, Spearman's rank correlation coefficient or Spearman's rho (ρ), is a nonparametric measure of rank correlation (statistical dependence between the rankings of two variables). It assesses how well the relationship between two variables can be described using a monotonic function. The Spearman correlation between two variables is equal to the Pearson correlation between the rank values of those two variables; while Pearson's correlation assesses linear relationships (whether linear or not). If there are not repeated data values, a perfect Spearman correlation of +1 and –1 occurs when each of the variables is a perfect monotone function or other[39] (Hernández Sampieri, Fernández-Collado, & Batista Lucio, 2006, p. 480; Lehman, 2005).

In total, 27 possible correlations were tested with the Spearman's rank correlation coefficients to verify or deny assumptions observed in the previous descriptive and analytic processes. Previously, a higher number of combinations between around 160 demographic variables was tested by the tool *Scatterplot matrix graph* of the statistical analysis functions of ArcGIS.This tool allows finding key variables by "examining the relationships between several variables" (Sattler, 2016[40]) (Figure 141).

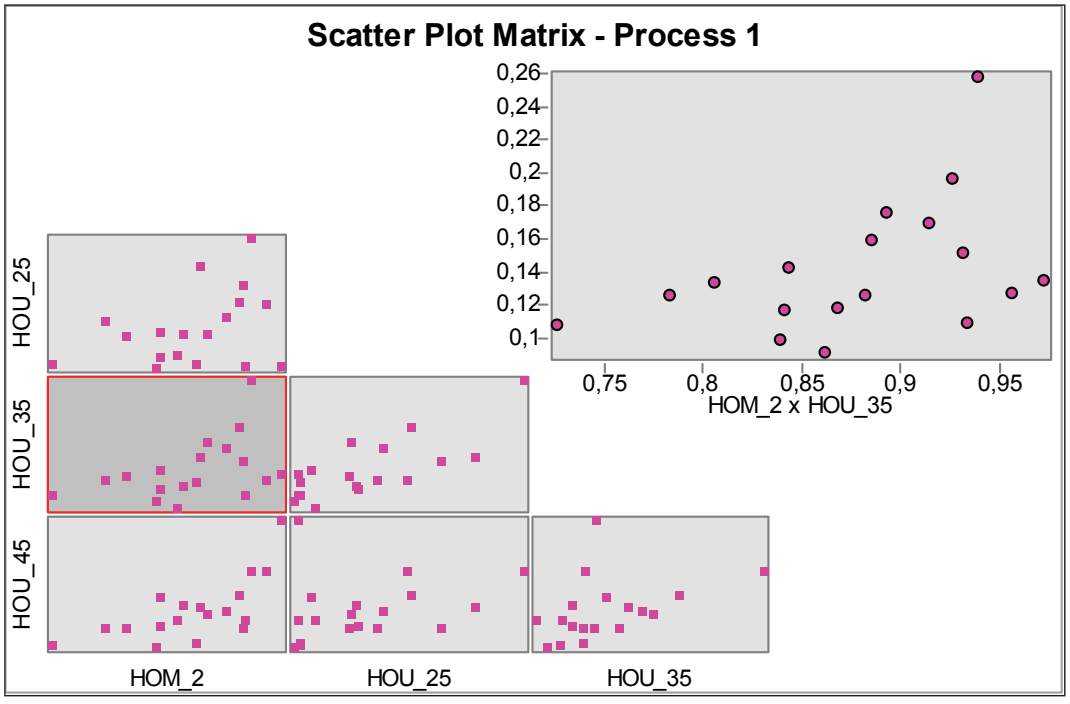


Figure 141: Scatter Plot Matrix by ArcGIS (Source: Own draft, 2016)

[39] (*) Source: https://en.wikipedia.org/wiki/Spearman%27s_rank_correlation_coefficient.
[40] "Exploring and modelling clusters", Manual of GIS courses, Institute of Geography, University of Duisburg-Essen.

The range to define the intensity of the correlation was defined as (Table 36):

No	Range	Correlation
1	Between 0 and +0.5	No correlation
2	Between +0.5 and +0.75	Weak positive correlation
3	Between +0.75 and +1	Strong positive correlation
4	Between 0 and -0.5	No correlation
5	Between -0.5 and -0.75	Weak negative correlation
6	Between -0.75 and -1	Strong negative correlation

Table 36: Ranges and intensities of correlations (Source: Own draft, 2016)

The calculation was carried out in Excel by the use of tables like the following example (Table 37). In this case, the variables *number of families living in poverty* or HOM-2 was tested with the variable *number of houses with roofs of poor condition* HOU-25. The outcome was a Spearman's correlation coefficient of 0.81, which represents a *strong correlation* between variables. Thus, is possible to assume that the high level of low income families in Puerto Lopez is correlated with the quality of the roofs of their houses.

Spearman correlation						
Process 1				Variables:	HOM_2	HOU_25
Sample	HOM_2	V1_Rank	HOU_25	V2_Rank	*d*	*d2*
1	144	6	21	11,5	-5,5	30,25
2	84	14	17	14,5	-0,5	0,25
3	73	18	11	18	0	0
4	116	10	31	6	4	16
5	85	13	17	14,5	-1,5	2,25
6	112	11	23	10	1	1
7	157	4	50	1	3	9
8	132	7	41	3,5	3,5	12,25
9	124	9	35	5	4	16
10	107	12	25	9	3	9
11	75	17	14	16,5	0,5	0,25
12	200	1	48	2	-1	1
13	186	2	28	7,5	-5,5	30,25
14	129	8	28	7,5	0,5	0,25
15	165	3	41	3,5	-0,5	0,25
16	80	16	18	13	3	9
17	81	15	14	16,5	-1,5	2,25
18	150	5	21	11,5	-6,5	42,25
					Sum d2	181,5
					n	18
					n3	5832
					n3-n	5814
					r	0,8127

Table 37: Spearman's correlation in Excel (Source: Own draft, 2016)

The same process was applied to six main assumptions discovered in Chapters 6 and 7 by the analysis of 27 combinations of demographic variables (Table 38).

#	Assumptions	Combination of variables		SRCC	Correlation
1	"The bad quality of houses would be related to the high levels of poverty."	**Families living in poverty (UBN)**	**Bad quality of roofs**	**+0.8127**	**Strong +**
		Families living in poverty (UBN)	**Bad quality of walls**	**+0.9396**	**Strong +**
		Families living in poverty (UBN)	**Bad quality of floors**	**+0.8700**	**Strong +**
2	"The bamboo, as a construction material for walls, is used in a first phase of settling by low income immigrant families."	Walls made of bamboo or wood	Families living in poverty (UBN)	+0.4355	No correlation
		Walls made of bamboo or wood	Persons living outside the canton five years ago	+0.4272	No correlation
3	"The main clients of the water tanker trucks are the low income families."	Houses that access to potable water only by tanker trucks	Families living in poverty (UBN)	+0.2157	No correlation
4	"While the rise of tourism contributed to the increase of salaried jobs in the town, it did not improve stability and access to health insurance."	Persons with public health insurance (IESS)	Families living in poverty (UBN)	+0.2513	No correlation
		Persons with public health insurance (IESS)	Persons currently occupied (working formally or informally)	+0.3772	No correlation
		Persons with public health insurance (IESS)	Persons currently unoccupied (not working formally or informally)	+0.4845	No correlation
5	"Well-paid jobs would be more accessible for skilled workers with a professional title."	Persons currently occupied (working formally or informally)	Persons with superior educational degree	+0.4097	No correlation
		Persons currently occupied (working formally or informally)	Persons with medium educational degree	**+0.6233**	Weak +
		Persons currently occupied (working formally or informally)	Persons with basic educational degree	**+0.5619**	Weak +
		Persons currently occupied (working formally or informally)	**Persons with secondary educational degree**	**+0.8467**	**Strong +**
		Persons currently occupied (working formally or informally)	**Persons with primary educational degree**	**+0.9216**	**Strong +**
		Persons currently occupied (working formally or informally)	Persons in alphabetization program	+0.3947	No correlation
		Persons currently occupied (working formally or informally)	Persons with pre-school educational degree	**+0.5315**	Weak +
		Persons currently occupied (working formally or informally)	Persons without education	**+0.6785**	Weak +
		Persons currently occupied (working formally or informally)	Illiterate persons	**+0.7178**	Weak +
6	"Families working in primary economic activities are poorer than families working in activities related to tourism."	Families living in poverty (UBN)	Persons working in farming, ranching, forestry or fishing	**+0.7228**	Weak +
		Families living in poverty (UBN)	Persons working in manufacturing industry	+0.4969	No correlation
		Families living in poverty (UBN)	Persons working in construction	+0.0619	No correlation
		Families living in poverty (UBN)	Persons working in wholesale trade and retail trade	+0.6651	Weak
		Families living in poverty (UBN)	Persons working in transport and storage service	+0.4443	No correlation
		Families living in poverty (UBN)	Persons working in accommodation and food services	+0.2188	No correlation
		Families living in poverty (UBN)	Persons working in information and communication services	+0.1042	No correlation
		Families living in poverty (UBN)	Persons working in finances and insurance services	+0.1842	No correlation
		Families living in poverty (UBN)	Persons working in management and services support	+0.5036	Weak +

Table 38: Correlations by SRCC (Source: Own draft, 2016; INEC, 2010)

The following conclusions could be identified:

(a) There is a strong positive correlation between poverty, and the bad quality of roofs, floors, and walls of houses in Puerto Lopez.
(b) There is no correlation between the use of bamboo and wood as construction materials in houses and the number of families living in poverty.
(c) There is no correlation between the use of bamboo and wood as building materials in houses and the number of immigrants who have arrived in Puerto Lopez for the last five years.
(d) There is no correlation between the number of families living in poverty and the number of houses that have to buy tanker trucks potable water daily.
(e) There is no correlation between the number of persons who have public health insurance, and the number of persons living in poverty, employed, and unemployed persons.
(f) There is a strong positive correlation between the persons currently occupied (working formally or informally), and the number of persons with secondary and primary educational degree.
(g) There is a weak relationship between the number of occupied persons (working formally or informally), and the number of persons with pre-school, basic and medium educational degree.
(h) There is a weak relationship between the number of occupied persons (working formally or informally), and the number of illiterate persons and persons without an educational degree.
(i) There is no correlation between the occupied persons (working formally or informally), and the number of persons with superior educational degree
(j) There is a weak relationship between families living in poverty, and persons working in primary economic activities (farming, ranching, forestry, and fishing).
(k) There is a weak relationship between families living in poverty and persons working in management and services support.
(l) There is no correlation between families living in poverty, and persons working in the manufacturing industry, construction, wholesale trade and retail trade, transport and storage service, accommodation and food services, information and communication services, or finances and insurance services.

The correlation between poverty and the severe conditions of dwellings (a) is clearly evident in the current process of informal urban growth in Puerto Lopez, as well as in the deterioration of old houses in the downtown and fringe belt. Low income families do not have the economic resources to improve substantially their houses, which the main outcome is the gradual deterioration of walls, roofs, and floors. Also, artisanal self-construction is a common practice in low income communities and neighbourhoods due to the high costs of materials and workforce. The lack of correlation between the uses of bamboo/wood as the construction material of houses and poverty (b), as well as with migration (c), was an interesting discovery that describes how unique and diverse are these transformative dynamics in each place.

Usually, in the largest cities of Ecuador, the construction of bamboo houses has been related to poor rural-urban families and informal urban growth. The lack of correlation between these variables demystifies this assumption in the specific case of Puerto Lopez. In other words, bamboo houses are not a particular outcome of low income families or new inhabitants who have migrated to Puerto Lopez for the last five years.

Another similar find was the no correlation between poverty and the consumption of tanker trucks water (d). Low income families are not the only consumers of this type of service. The deficiency of the public water service has been affecting to all the inhabitants of Puerto Lopez, no matter their location or income. What is for sure true is that the impact of this limitation has been hitting stronger for low income families who pay for an expensive product, which is also a human right.

The correlations between employed persons and their various degrees of education are also relevant to analyse independently. Originally, it was assumed that unskilled individuals and without an educational degree, were not able to access to the new labour market triggered by tourism in Puerto Lopez. However, the correlations and no correlations between the current labour force and its educational degree allow observing specific dynamics.

Firstly, there is a strong relationship between the working people and the persons with primary and secondary educational degree (f). Likewise, there is a weak relationship between employment and people with pre-school, basic, medium, educational degrees (g), and even with illiterate people and without an educational degree (h). On the contrary, there is no correlation between employed individuals and persons with superior educational degree or professionals (i).

What seems to be happening in the case of Puerto Lopez is that the current labour offer is predominantly providing job places for unskilled persons and individuals with school and high school degrees. Professionals graduated in universities are not a majority working in the current labour market which has been leading the main local tertiary and primary economic activities (tourism services, fishing and farming). These dynamics contribute to feeding the vicious circle of poverty, where low income families have no possibilities to improve their economic incomes and quality of life due to the lack of opportunities offered by the same local market.

Finally, the weak correlation between families living in poverty and persons working in primary economic activities like farming, ranching, forestry and fishing (j), as well as the lack of correlation between individuals living in poverty and working in other economic activities (k, l), corroborate the previous suspicion. The majority of the labour force in Puerto Lopez is working in primary and tertiary economic activities that do not require high skills or superior educational degrees.

8. Socio-spatial transformations and sustainable urban planning

In the preceding chapter, the six urban forms provided a first radiography of the transformation and evolution process of Puerto Lopez over the last two decades. The present chapter focuses on the discussion of questions, which emerged after contrasting the new statistical and cartographic information obtained. How can the analysis of the urban forms contribute to improving the quality of local urban planning? How can this method of reading, understanding, measuring, and evaluating the quality of urban growth be transferred into local governance that takes decisions on different scales? Moreover, how can the outcomes of this analysis reach the diverse shapes of local actors who do not have access to this information or do not understand it due to the technical and/or academic jargon commonly used?

This chapter explores these basic questions with the aim of finding new channels of communication between scientific research and decision makers, both directly related to spatial and urban planning. Rethinking how settlements like Puerto Lopez have been transformed and should be planned is necessary to break the vicious circle of inequality and poverty in rural areas. However, without involving local agents, any initiative will be unfruitful (UN-Habitat, 2016b; UN-Habitat, 2015b; Boisier, 2005).

Two future scenarios of the urban growth of Puerto Lopez were drafted. The first scenario graphically exhibits the probable surface, land uses and structure of the city in 2030, assuming that the current rhythm of uncontrolled and informal urban expansion would continue without any direct intervention by the local urban planning. The second one seeks to show a positive urban growth, in the case of which the complex organism of the city adapts and integrates the functioning of the natural landscape.

In the last section of the chapter, the importance of disseminating this knowledge into local communities is highlighted. One of the most common points of critic mentioned by local governments in developing countries is that the scientific community produces plenty of desk research in their ivory tower, but fewer ideas, proposals, or solutions in the field. This research aims to contradict this subjective assumption by proposing guidelines and suggestions to improve the quality of urban growth of Puerto Lopez based on the study of its urban grain.

8.1. The present and future of Puerto Lopez: scenarios 2030

8.1.1. The consequences of an unsustainable and not resilient urban growth

A scheme of the urban evolution of Puerto Lopez has been drafted combining the *model of beach resort formation* by Smith (1991) (Williams, 2009, p. 93; Figure 88), and the characterisation of the new six urban forms. It is a graphic representation of the progressive transformation experienced by this settlement over the last two decades and its relation to the restructuring of the local economy by tourism. The changes of the land use and urban structure, as well as the emerging of new urban forms, have been included (Figure 142).

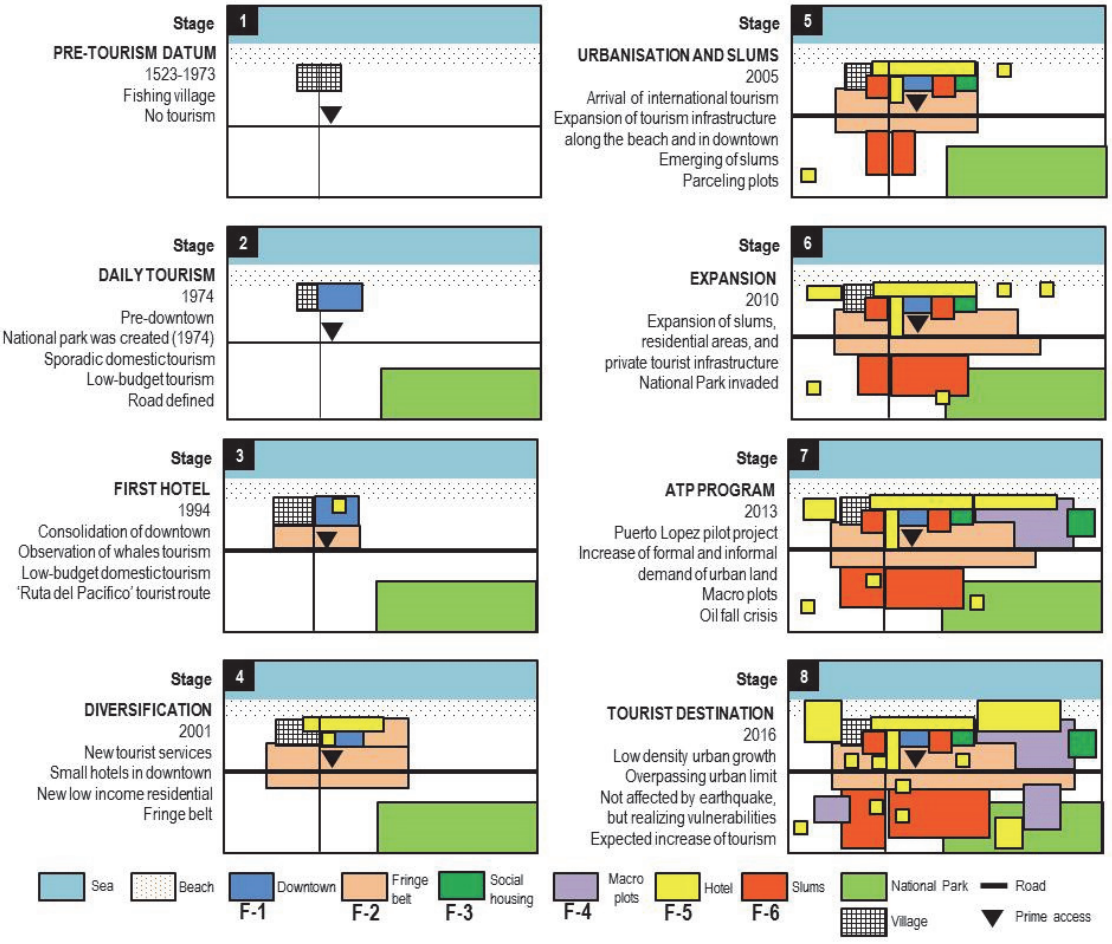


Figure 142: Puerto Lopez in the scheme of tourist resort formation (Source: Own draft based on Smith, 1991)

The urban growth of Puerto Lopez has been divided into eight stages, each one with the dominant urban forms and land uses. Due to the differences in social and economic contexts in developed and developing countries, the sequence and the location of the urban forms differ remarkably from the original model by Smith (1991). However, both share the same basic goal i.e. to show the process of transformation of a coastal settlement into a beach resort.

In Stage 8, which represents the 2016 situation, Puerto Lopez is a small tourist city with a complex structure composed of dichotomous urban forms that are colliding and continuously mixed up between each other in the course of the formal and informal low-density urban expansion process. Like other coastal towns and cities affected by the last earthquake in 2016, Puerto Lopez realised its high levels of vulnerability and exposure.

Its urban limit and the border of the Machalilla National Park are under intense pressure from both sides (MAE, 2007; Harris et al., 2004). From the one hand, urbanisation has continuously been pushing and overpassing the formal border calling for new affordable land. From the contrary, the natural landscape and its species stand in a daily fight to survive and to keep their close connections to the sea, which is a basic condition of a normal operability and reproduction of the natural system and its biodiversity (Figure 143).

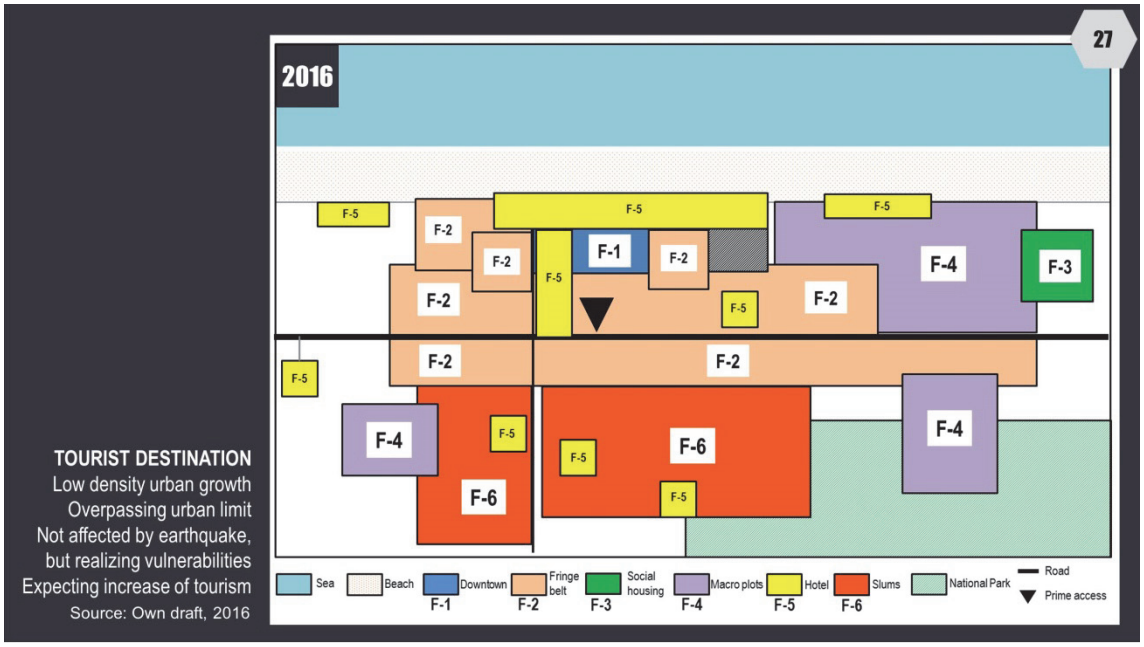


Figure 143: Stage 8, post-earthquake (Source: Own draft based on Smith, 1991)

As it has been analysed in Chapter 6, this type of urban growth is not sustainable and not resilient. The current urban forms, which are the outcome of the formal and informal urban expansion of Puerto Lopez over the last two decades, have not been planned, designed, and built technically to improve the sustainability and the capacity of resilience of the entire urban system. Consequently, there is a dichotomy between the development of the old fishing town and the new tourist city (Pozo, et al., 2014; Harris et al., 2004).

8.1.2. Puerto Lopez in 2016: the price of doing nothing

Particularly, during the period 2001-2010, the urban growth experienced an acceleration of low-density expansion to the hilly eastern peripheries (F-6), which in some specific places overpassed the official urban limit and invaded the national park. The predominant urban form that is fuelling this expansion is F-6 or low income housing. It is characterised by a rapid consumption of land, no matter how rugged the topography may be, and by high levels of vulnerability and exposure to natural disasters. Additionally, the lack of access to essential services turned it into a hotspot of sanitary problems and pollution. In this specific case, urbanisation can be understood as a direct threat to the natural environment and the biodiversity that shape it.

From 1990 to 2010, Puerto Lopez required almost 180 hectares more to expand its urban limit. Regarding the rise of tourism due to the international promotion of this settlement as a tourist destination by the national government, the demand for affordable land for this type of low-density urban growth will also increase exponentially. Nevertheless, informal housing is not the only type of urban growth that is putting pressure on the borders of the natural landscape. The process of densification in the downtown (F-1), the consolidation of a fringe belt around it (F-2), the new social housing projects and *lotizaciones* (F-3), the legal emerging of macro plots (F-4), and the private tourist infrastructure (F-5), are also competing for occupying urban space.

In the downtown, the diversification of tourism services and complementary retails stimulated the densification and parcelling of plots. The construction of hotels, hostels, and hosterias triggered the emerging of retailing and informal commerce. The surrounding fringe belt has been influenced by a similar process of densification and plot-parcelling, but with the focus on residential land use. The old fishing village located at the southern section of the beach called *La Ensenada* was trapped inside this urban sprawl, and nowadays is one of the several hotspots of extreme poverty and exposure due to the bad quality of housing and urban space.

The improvement of the Spondylus Route as a tourist corridor fostered the densification of this fringe belt along the eastern and western sides of the road. Both downtown and fringe belt have consolidated as a dense core of residential, retailing and tourism land uses. Initially, this dynamic has been understood as urban development, but without a local urban planning that could realise the implications of such a rapid process of urbanisation on the natural environment, this process became a chaos. Next to new urban problems caused by overcrowding, burdening and overconsumption, the most significant issue was only visible in rainy seasons, or when *El Niño* hit strongly. This core of urbanisation is located over the natural *spillway* of the muddy flows that slide down from the hilly landscape to the sea. Heavy rainfalls sweep mud and rocks from the muddy soil of the hills to the flat downtown.

The other urban forms (F-3, F-4, and F-5) had another type of growth dynamics (dispersed or concentrated), but also imply a substantial threat to the environment due to their particular operating and reproducing features. Social housing (F-3), as an official response of the national government to the demand for fair housing to relocate the low income families living in informal risk conditions, has mainly been located in the northern sector of the beach. For the construction of this new urban area, a mangrove forest has progressively been destroyed. Likewise, new macro plots (F-4) emerged in this area and along the northern beach, which accelerated its destruction or, as it was probably locally understood, urbanisation. This estuary, as a natural connection between the sea and the rivers system, contributed to the increase of the terrestrial and marine biodiversity. Nowadays, it is an urban area planned to be occupied by second homes (probably gated communities), and private tourist infrastructure (F-5) (beach resorts, lodges, hosterias, hotels).

Nevertheless, the lack of resilient urban planning and the political ambition of occupying this biodiversity hotspot did not let to the new settlers realise that this area is a natural floodable land extremely exposed to the direct impact of tsunamis, high tides, floods, and landslides. The bulldozing of this mangrove forest and of the estuary was the most catastrophic impact to the equilibrium of the ecosystems and natural landscape that surrounds this fishing town. According to interviews with old natives, this area was a natural multiplier of biodiversity on earth and sea, and there was no other similar ecosystem for many kilometres around. Today, they recognise that the quantity of marine and terrestrial species is extremely low, and this affects directly their traditional ways of life closely interconnected to artisanal fishing and self-consumption of natural resources (Figure 1).

In 2013, the ATP program had officially been launched and promised to organise the future development of this town to transform it into the pilot project of an emblematic program of development by promoting ecotourism. Despite the first emotion, nowadays this initiative has not been completely implemented. However, the main deficiency of this initiative is that it repeats the same tendencies of distribution of the land use inside the urban area. Additionally, there is not a deep study or analysis about the quality of the urban growth regarding sustainability or resilience (Figure 144).

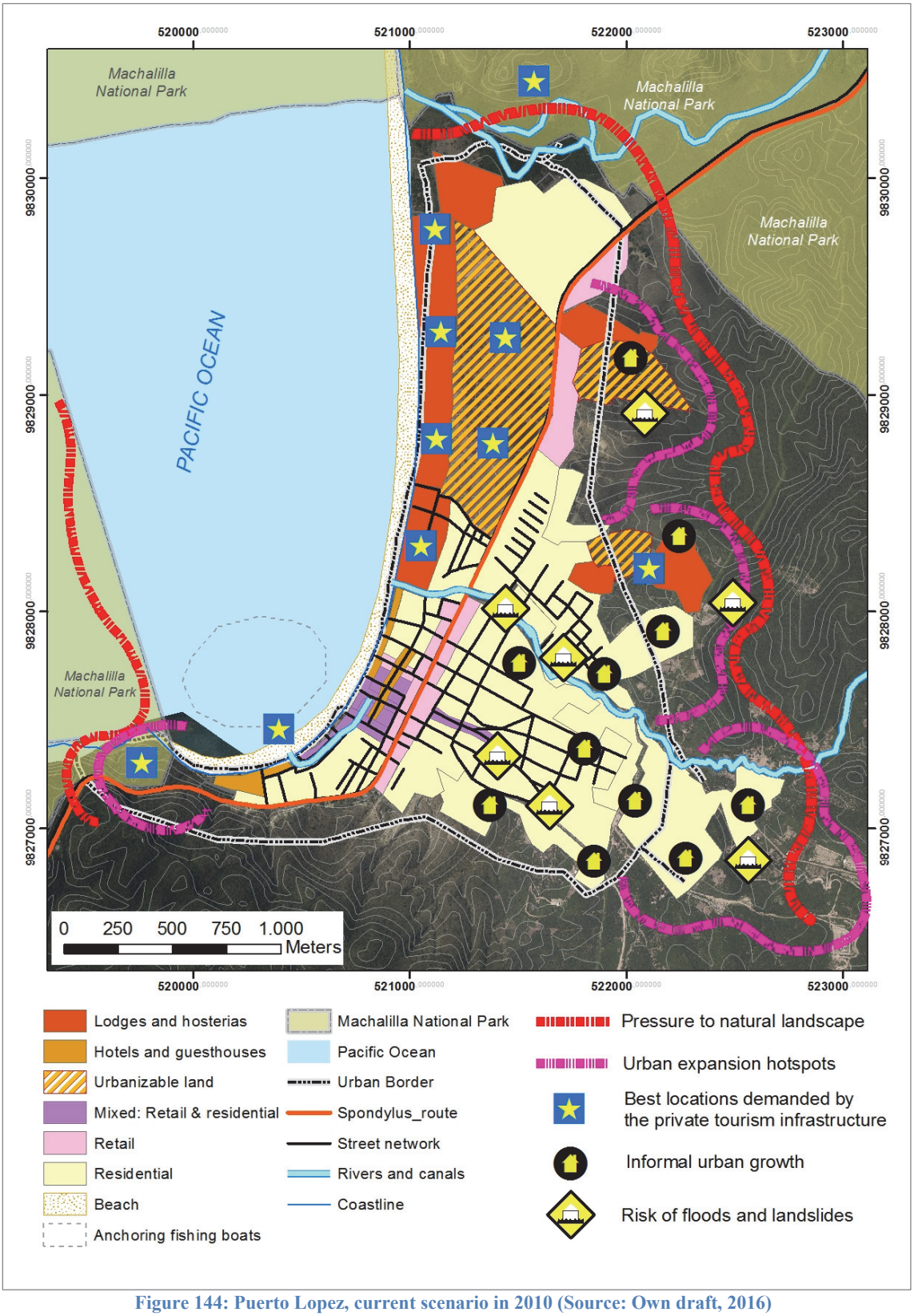


Figure 144: Puerto Lopez, current scenario in 2010 (Source: Own draft, 2016)

In 2016, the urban area of Puerto Lopez faces the challenges of urbanisation. The 7.8 earthquake that hit the northern coastal region opened the eyes of local actors and decision-makers, who realised that they are much more vulnerable as they had thought or expected. Despite that, Puerto Lopez did not experience substantial damages, the destruction and deaths

similar old fishing villages in the north that had been transformed into beach resorts like Pedernales, Jama, or Canoa, was an illuminating example considering the exposure to natural disasters (Figure 145).

Figure 145: Destruction after the 7.8 earthquake in Ecuador (Photos: http://www.elcomercio.com[41])
(1 and 5) Pedernales, (2) Portoviejo, (3 and 4) Manta

The price of the deficient quality of urban growth was extremely high: 673 persons deceased, nine disappeared, 6,274 have been injured, 28,775 lost their houses, 3,000 buildings were destroyed or demolished, and 30,600 buildings were damaged (SNI, 2016). This tragedy was a milestone in the urban planning and construction of Ecuadorian cities. Discussions arose on the national and civil scales about the informality in the building and the relaxed technical controls. Particularly, local media and politicians have been exchanging plenty of objective and subjective approaches about responsibilities in the way that cities are planned and constructed. Likewise, other realities have been brought to fight that increased the general preoccupation. The 95% of all the destroyed buildings were not insured, 90% were not older than 30 years, and were built of contemporary construction materials like concrete, cement bricks, and steel. In other words, the most destroyed buildings were those that had been recently constructed during the tourist boom.

[41] Source: http://www.elcomercio.com/galerias/sismo-ecuador-manabi-pichincha.html

8.1.3. No-intervention scenario 2030: the triumph of bulldozer urbanisation

What will be the next phase, or stage 9, of the urban growth of Puerto Lopez as a globalised tourist destination? How much additonal urbanisable land will be demanded or required without significant interventions regarding sustainable and resilient urban planning? What will be the further extents of this "urban tsunami"? To what degree will the natural landscape and the endemic species be affected?

The future demand for affordable land can be calculated by comparing the increase in population and number of houses in the last three national censuses (1990, 2001, and 2010), with the projected rise of the population for years 2020 and 2030. According to official statistical projections, the population in Puerto Lopez will increase by 33.87% by 2020, which means 13,192 new inhabitants. Using the same percentage of growth, the 2030 population will sum up to 17,660 inhabitants. Assuming that the former type of low-density expansive urban growth will continue, the urban surface will reach 476 hectares in 2020, and 592 hectares in 2030 (Table 39).

Variables	1990	2001	2010	2020	2030
Population	5,675	7,720	9,854	13,192	17,660
Percentage of population increase	-	+36.03%	+27.64%	+33.87%	+33.87%
Number of houses	984	1,610	2,403	3,586	5,352
Percentage of houses increase	-	+63.62%	+49.25%	+49.25%	+49.25%
Urban surface (ha)	203.74	308	383.07	476.42	592.52
Percentage of urban surface increase	-	+51.17%	+24.37%	+24.37%	+24.37%

Table 39: Population, number of houses, and urban area in 2020 and 2030 (Source: INEC, 2010)

In a future scenario without a profound and technical intervention in the velocity of urban growth, which is fuelled by a high demand of land due to regional immigration, the urban area of Puerto Lopez will have doubled by 2030. If the quality and quantity of the urban growth experienced by this settlement during the last 20 years continue for the following two decades, the environmental and social impacts will consequently be multiplied exponentially.

Particularly, the immigration of new inhabitants coming from the surrounding towns and villages, and even from other rural areas of the whole province and region, will increase the demand for affordable land for low income families (F-6). This pressure could influence the relaxed urban planning, and the municipal limits could be extended progressively. Nevertheless, the access to affordable land will still have a dichotomous nature, mainly based on the high levels of inequality in the access to essential services, and quality of land (Figure 146).

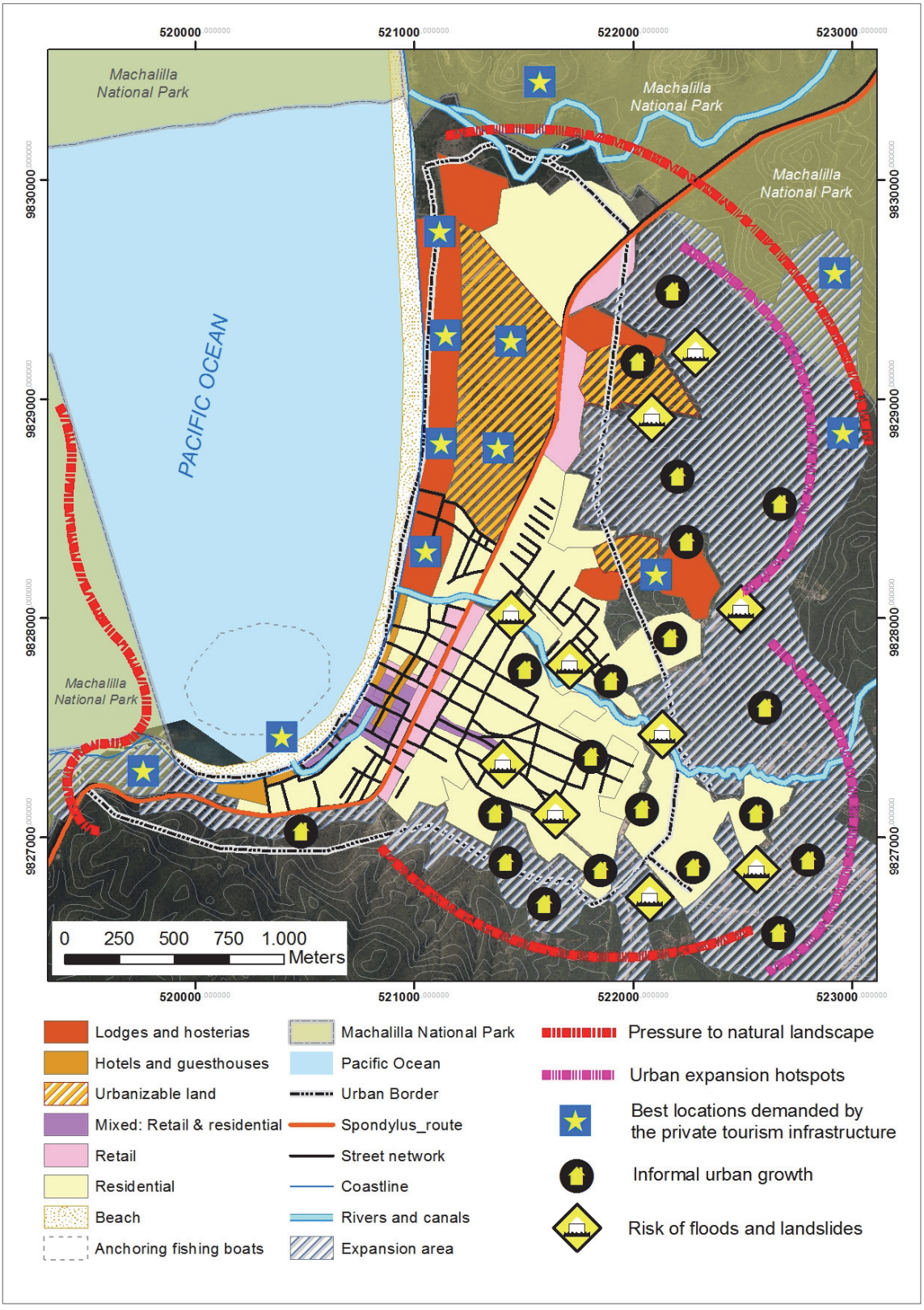


Figure 146: Puerto Lopez, scenario 2030 of no-intervention (Source: Own draft, 2016)

In 2010, some 40% of the urban area is still vacant, and the majority of this area falls into the northern macro plots (F-4), which are officially registered in the municipal cadastre. It is precisely the land with the quality regarding location and access to essential services. The most probable outcome is that these surfaces will be occupied by beach resorts, hotels, hostels, and

hosterias, whose owners, foreign tourist investors, have the economic capacity to buy them legally.

On the other hand, this land is not affordable for low income families, who represent 90.80% of the total population in 2010. As a result, the expansion of informal and low income urbanisation (slums) will increase, especially in the hilly eastern peripheries where the land is not appropriate for settling due to the high exposure to natural disasters like earthquakes, floods, and landslides. The *no-intervention* scenario in 2030 could be understood as a common process of modern urbanisation or as the natural transformation of a town into a medium sized city. However, the replication of the actual scheme of urban growth will mean the reproduction of a dichotomous, unsustainable, and not resilient built space (Figure 147).

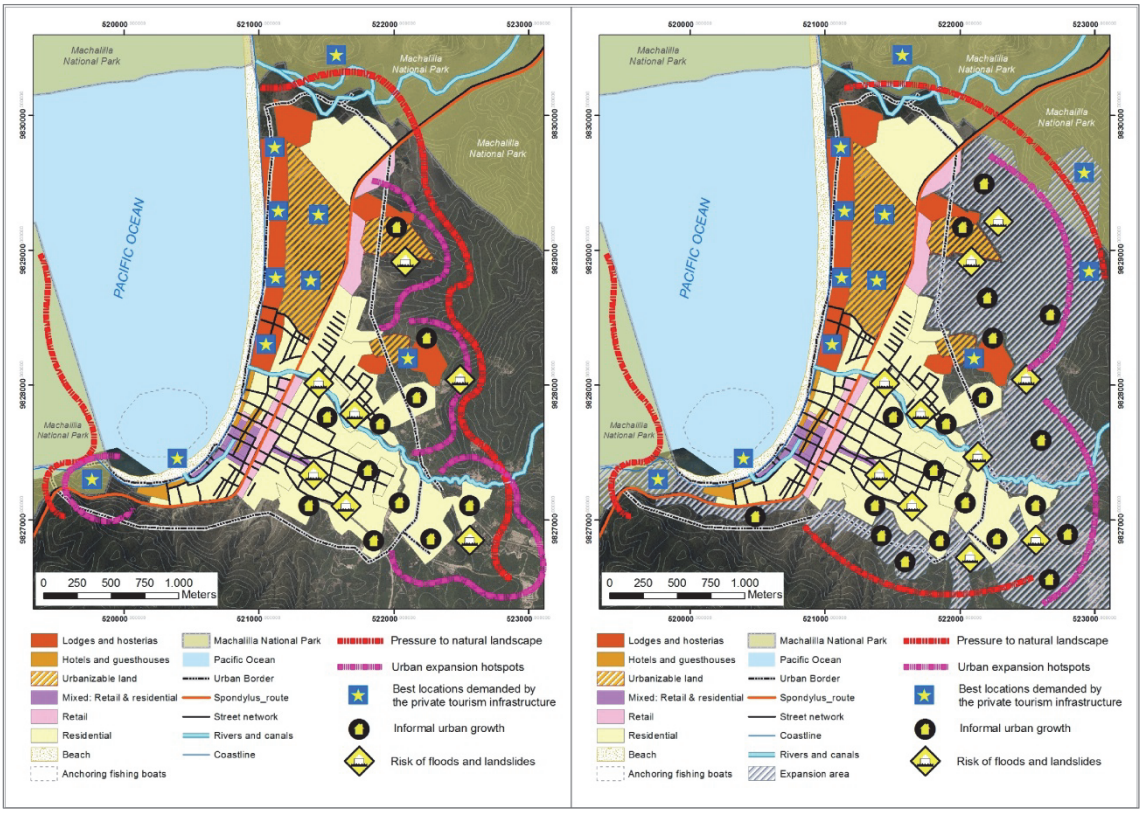


Figure 147: Comparison of scenarios 2010 and 2030 (Source: Own draft, 2016)

The winners of this transformation will be the foreign investors and the local elites, as they will be able to reproduce their capital easily by the rise of tourism or to remove it in the case that tourism falls. The losers will be the low income families and the natural environment, who will receive the direct impacts of this uncontrolled transformation. The winners will avoid seeing the reality of the losers, expressed in the bad quality of the urban space in slums, but at the same time, they will need them as a cheap and useful workforce (Knox & McCarthy, 2012; Britton, 1991).

The natural environment will suffer from a progressive deforestation and a loss of biodiversity. The place of Puerto Lopez has once been an estuary composed by three rivers, floodable land,

slimy and muddy soil, and a mangrove forest along the beach. Originally, it was the natural connection between the marine and the terrestrial ecosystems. Nowadays, the urban area is an artificial barrier or blockage that constrains this natural connection, which is vital for the reproduction of endemic species. If the urban growth continues with the present dynamics, the biodiversity cannot be guaranteed to survive until 2030.

Likewise, this urban sprawl will not only destroy forests and biodiversity. Underneath the ground, there is an invaluable treasure that will also be inevitable destroyed: the archaeological heritage. As it has happened in the last twenty years, plenty of new remains of the pre-Hispanic city of Cercapez will be discovered, but at the same time destroyed. The formal and informal urban growth of Puerto Lopez has had no respect for this historical heritage, which represents the roots and original identity of the native families (Lunniss, 2014).

The prognosis of Puerto Lopez for the year 2030 is not as promising as it could be expected. The current urban growth, urban planning, and urban design of this city is not adapted to the natural environment and its historical shapes and has no positive symbiotic relation with them. The urban forms of the current urban area do not fit in the millenary natural morphology and history of this coastal ecosystem and landscape. The *modern urbanisation* imposes their forms and occupies the landscape by bulldozing any topography of the landscape or archaeological remains that do not adapt to its standards. This total disconnection of the human settlements from the natural landscape, or the negation of nature, could be understood as part of the historical development of modern cities around the world. Nevertheless, in the case of the new generations of natives, who have been living in extreme levels of poverty in rural regions, this image of modern urbanisation composed by buildings, asphalt, concrete, artificial lights, autos, technology, office jobs, and boiling commerce in streets, is a vision of social development, economic progress, and modernity. For plenty of them, the natural landscape and the archaeological remains mean the old rural past to overtake to gain underdevelopment (Lunniss, 2014; Pozo, et al., 2014; Harris et al., 2004).

On the contrary, the pre-Hispanic coastal cities and their ways of life were completely connected with and dependent on the ecosystems and the natural landscapes. Their lives revolved around the natural landscape, which was composed by the enormous biodiversity of the forest and the sea, as well as astronomy. In their religion, animals, plants, and celestial bodies were their deities or gods (Lunniss, 2014). A change of the vision of development, especially in the new generations of inhabitants, is urgently required to contribute to the plan, design, and construction of a city and community connected and adapted to the natural landscape and its historical roots. Otherwise, the dark scenario of 2030 would be not just a scheme, but it will be a reality with plenty of new problems to solve and without a local community committed to doing it. In addition to the implementation of the Sustainability

Development Goals (SDGs) of the New Urban Agenda 2030, Puerto Lopez needs to prioritise resources for the reconstruction of these connections by community building in order to walk on the path of a real sustainable development.

In this scenario of no intervention in 2030, the triumph of the *bulldozing urbanisation* over the natural landscape predominates in the expansion of the urban surface. The lack of technical studies in the process of urbanising the peripheries increased the levels of vulnerability and exposure to natural disasters in the formal and informal urban forms. The effects of climate change on the southern Pacific coasts are visible and impact directly on the human settlements located alongside. The intensity and recurrence of El Niño and La Niña increment the yearly losses of infrastructure, properties, and lives in several towns and small cities like Puerto Lopez.

In 2030, the recurrent floods, landslides, high tides, and storms, as well as the risk of being impacted by earthquakes or tsunamis, pushed the inhabitants of the flat downtown, fringe belt, and northern residential and tourist urban areas along the beach, to migrate and settle on the hilly peripheries by invading the Machalilla National Park and bulldozing the natural landscape. The number of endemic species in the marine and terrestrial ecosystems experienced a dramatic decrease due to the rising demand of natural resources.

Likewise, the tourism industry, which successfully had established and expanded along the beach, progressively abandoned the town due to the high risks and exposure to natural disasters, and the rapid deterioration of the built space and the sanitary conditions. The peripheral slums are hotspots of diseases. This situation directly affects the number of arrivals of international tourists, who avoid visiting this tourist destination due to the fear of diseases and natural disasters. The fall of tourism as an economic monoculture and the depreciation of artisanal fishing and farming due to the low levels of biodiversity increase the already high levels of poverty and unemployment. As a consequence, insecurity rises and chases away the last domestic and international tourists who still arrive.

8.1.4. The sustainable urban forms that Puerto Lopez needs

After observing this poor prognosis about the expansive urban growth of Puerto Lopez, three main questions emerge. Which is the best urban form to be reproduced or improved in Puerto Lopez? Which is the worst and should be avoided? How should the urban forms be transformed or improved to be more sustainable? The answers are not easy to find, and even more if the previously discussed lack of connection with the natural landscape is not considered. However, there is a scientific term and measure that could help to clarify impacts and responsibilities of each urban form in the future process of urban growth: the ecological footprint (Wackernagel & Rees, 1996).

The ecological footprint is a method to measure the human impact on the ecosystems of the earth. The unit that is used is the "area of wilderness" or "amount of natural capital" consumed each year (Wackernagel & Rees, 1996). Letting alone that Ecuador is one of the countries with the lowest ecological footprint in the world, in the urban scale, its cities produce substantial impacts on the environment as a result of the wide gaps regarding social inequalities. While in the rich neighbourhoods and gated communities the consumerist ways of life generate overconsumption of water, energy (e.g. air conditioning or heating) and increment pollution due to car dependency, in the massive and overcrowded slums the deficient quality of essential services and the lack of waste treatment produce an enormous quantity of pollution. The Ecuadorian and Latin American urban areas are characterised by their high levels of social and spatial fragmentation expressed in patches of rich and poor communities or neighbourhoods (De Mattos, 2010).

In Puerto Lopez, these differences between rich and poor patches replay themselves on a smaller scale, but with the same impact on the surrounding natural landscape. As it has been observed in the previous chapter, the six urban forms differ regarding poverty, access to essential services and quality of housing. There are urban forms that are more vulnerable and poorer than others. Likewise, there are also disparities of the ecological footprint that each of them generates.

The following table (Table 40) has been produced by using basic standards of water and energy consumption, and CO_2 emission per person in Ecuadorian low and middle income homes (INEC, 2010). Because the residential land use predominates in 4 urban forms (F-1, F-2. F-3, and F-6), these standards were multiplied by the number of inhabitants of each urban form and subsequently divided to their respective surface in hectares. In the case of the private tourist infrastructure or F-5, the standards applied were elaborated by the World Tourism Organization (WTO). Macro plots (F-4) were not included because they were not occupied in 2010.

The widest gap of ecological footprint production is between the private tourist infrastructure (F-5), and the low income housing areas (F-6). While the first requires high quantities of water, and energy to operate, and produces pollution and a huge amount of CO_2, for the latter the access to water and energy is limited and extremely expensive, but at the same time it produces high levels of pollution due to the lack of sanitary services like sewage system, and solid waste treatment (Table 40).

Urban form	Energy use (ha)	CO2 emissions (ha)	Water consumption (ha)	Solid waste production (ha)	Pollution (ha)	Ecological footprint (ha)
F-1	Medium	High	Medium	High	High	Medium
F-2	Medium	Medium	Medium	Medium	Medium	Medium
F-3	Low	Low	Low	Low	High	Low
F-4	-	-	-	-	-	-
F-5	High	High	High	High	High	High
F-6	Low	Low	Low	Low	Medium	Low
Total	Medium	Medium	Medium	Medium	High	Medium

Table 40: The ecological footprint of urban forms (Source: WTO, 2012; INEC, 2010)

On a middle level, there are mixed land uses in downtown (F-1) and the residential fringe belt (F-2). Especially, in the first, the combination of retails, restaurants, hotels, and other services related to tourism increases the consumption of energy, water, as well as the emission of pollution and solid wastes. Nevertheless, its ecological footprint is clearly not comparable to the exclusive and expensive beach resorts and lodges.

For the last decades, the international tourism industry has developed plenty of innovations to measure and reduce the ecological footprint of this economic activity in tourist destinations. The implementation of green stamps and normative with standardised processes and infrastructure has been implemented in international tourist destinations of diverse countries. However, its responsibility regarding triggering directly or indirectly the expansion of informal urban areas, and the impact regarding the destruction of natural landscapes, has not been measured yet.

What is observable by the analysis of the sustainability and resilience of the urban forms of Puerto Lopez is that the highest impacts on the natural environment are concentrated in the new tourist infrastructure (F-5), and in the new slums or low income housing areas (F-6). Both could be read as the main hotspots of inequality that contribute to the rise of the ecological footprint in Puerto Lopez. The expansion of both urban forms should be more studied, measured, controlled, and monitored.

8.1.5. Intervention Scenario 2030: global biodiversity and resilience hotspot

Based on the previous analysis, a desirable future scenario of sustainable urban growth up to 2030 is suggested in the following scheme (Figure 148).

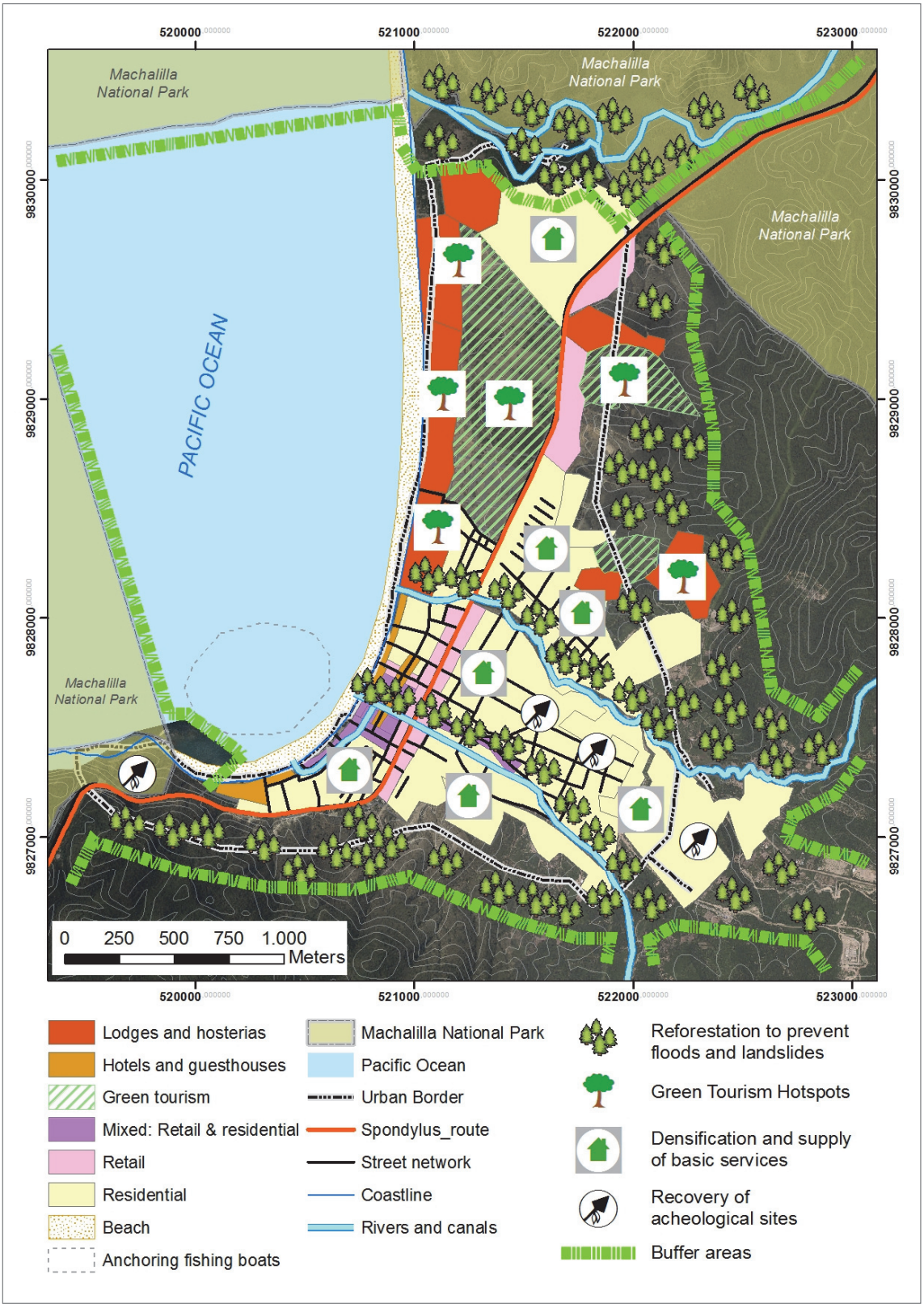


Figure 148: Biodiversity hotspot 2030 (Source: Own draft, 2016)

It is not a master plan, but it is a graphic representation that summarises the main guidelines identified in this chapter to promote a sustainable and resilient urban growth in Puerto Lopez. It seeks to obtain the maximum reduction of the ecological footprint in the process of consolidation of the urban forms and to contribute directly to the increase of biodiversity by including it in the urban planning as a natural asset. Likewise, archaeological heritage is appraised as a strategic resource to foster social cohesion and build resilient communities by recovering the local identity and culture. The main guidelines are:

1. Reducing the vulnerability and exposure of low income housing and residential areas by improving access to basic services, and promoting the construction with sustainable construction materials like bamboo or recycled wood.
2. Reducing the ecological footprint by controlling the overconsumption of energy and water in tourist resorts and lodges. Implementing a local-global green stamp that fosters the use of green technology, bioclimatic urban and architectural design.
3. Stimulating densification instead of low-density urban expansion by the implementation of a new urban plan engaged with the ATP program.
4. Reforestation of the original mangrove forest in the northern estuary, and designation as a green connector between the marine and terrestrial ecosystems of the Machalilla National Park.
5. Transforming the rivers, which cross Puerto Lopez from the steep eastern valley to the western beach, into green corridors to restore biodiversity and channel the water during rainy seasons.
6. Appreciating the natural and archaeological heritage by including it in urban planning as a green infrastructure strategic for the reproduction of social benefits and the main economic activities (ecotourism, artisanal fishing, and farming).
7. Redesigning the public space and streets of the tourist downtown to avoid the use of cars and other motorised vehicles.
8. Promoting the public participation by the inclusion of communities of all the neighbourhoods in a program of evaluating the natural and archaeological heritage.

The main goal is to achieve a sustainable transformation of this town into a settlement that supports the reproduction of biodiversity and the preservation of the natural and archaeological heritage, instead of transforming this city into a international tourism enclave that predates natural resources and erases local identity. Archaeological heritage is also evaluated as a strategic resource to reproduce social cohesion and building resilient communities by recovering the local identity and culture. The main idea behind this scheme is that Puerto Lopez does not a further expansion in the following 15 or 30 years. Instead of continuing the current process of uncontrolled low-density urban expansion, the scheme proposes to rethink and redesign the

actual urban forms in order to gain the maximum positive leverage of the urban area without affecting the surrounding natural landscapes and archaeological heritage. After having evaluated each urban form in terms of sustainability and resilience in Chapter 7, the weak features to be improved could be directly tackled with specific actions like programs or projects. The current expansion areas that are not occupied yet can be audited to define the most optimal type of improved urban form that should be promoted and developed. Obviously, it aims not to affect negatively the natural development of the private land market.

However, this scheme is a powerful tool to visualise de urban growth of a town and provides the local government, the decision-makers and the citizens with the capacity to plan and monitor the effects of the transformative forces related to globalisation and the reproduction of capital. Paraphrasing a basic concept of sustainable urban planning and the importance of managing information: "We cannot plan, what we do not understand" (Boisier, 2005). By comparing the two scenarios of urban growth of Puerto Lopez until 2030, the difference between an uncontrolled urban expansion and a planned process of densification with the adaptation of the urban forms to the topography and morphology of the natural landscape can be observed. By improving the way that the land is urbanised, the high levels of exposure to natural disasters could significantly be reduced (Figure 149).

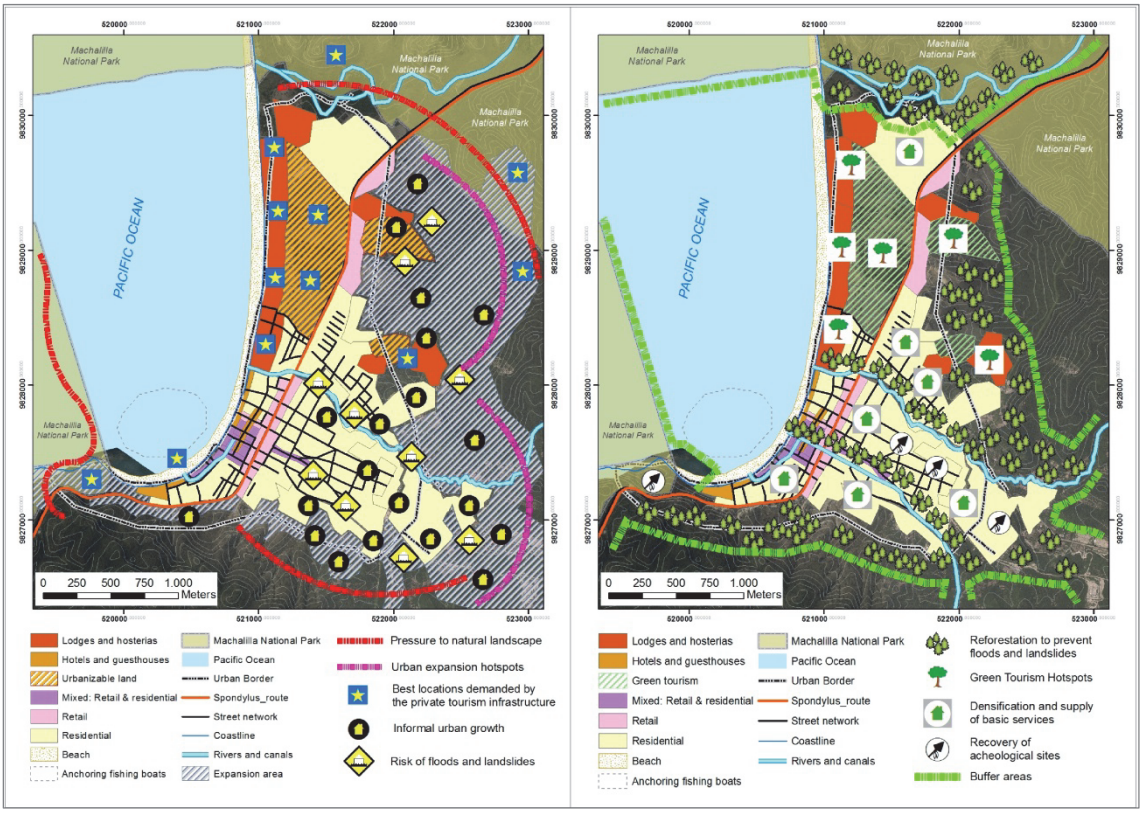


Figure 149: Comparison between scenarios (Source: Own draft, 2016)

8.1.6. Infecting a new model of urban growth along the Spondylus Route

The transformation of Puerto Lopez into a sustainable settlement, as a pilot project of the ATP program or as any other initiative, can have a positive or negative multiplier effect in the entire Spondylus region. Like this small city, hundreds of other towns and villages are experiencing the arrival of tourism and the increase of impacts on their natural and built environments. The knowledge about the nature of the social and spatial transformations related to tourism, or to any other globalised economic activity, is entirely unknown to the local urban planning and local actors. Including a new methodology for the planning of the urban growth could be a significant contribution to take control of the urban expansion or could be the popularisation of an incorrect way of planning these settlements that would trigger negative consequences.

In Chapter 5, it has been mentioned that along the central coastal region of Ecuador the local governments have practically been reproducing the *Regeneración Urbana* urban project developed in Guayaquil over the last decade. This urban renovation has been the emblematic project of the local government to recuperate and change the urban image of public spaces like parks, streets, squares, and green areas. Despite the critics posted by local architects, claiming that the urban design was imported and that there was no relation to the historical past of the cities, this urban project has been replicated by plenty of small local governments in the coastal region as a new image of urban development and modernity. The same reaction is being expected if the Puerto Lopez pilot project is successful. The infection of this positive or negative transformation would spread along the coastal region. That is why the relevance of understanding the past transformations to plan the future ones into a context of sustainability and resilience between the natural and the built environments. There are not many options to choose and more time to loss. The arrival of climate change effects is imminent for the ongoing 21st century.

The positive outcomes of a sustainable urban planning and protection of the natural and archaeological heritage could be a way of promoting Puerto Lopez internationally as a real green tourist destination. If this initiative is promoted properly by means of the internet and international media, it could catch the interest of future visitors and institutions working on the conservation of species and adapting to the climate change effects.

The inclusion of methods to identify and evaluate the quality of the urban growth of towns and small cities by the use of urban forms can be a new useful tool to plan and better to design them. In current PDOTs (Development and territorial planning plan) of Puerto Lopez and in other urban planning tools a profound morphological study of the evolution of the settlement and the urban forms that shape it is missing.

The last earthquake that hit the Ecuadorian northern coastal region in April 2016 showed clearly that the predominant informality in the urban growth in Ecuadorian cities exponentially increased the levels of exposure of buildings and houses due to the bad quality of construction with materials that are not part of the natural environment. In the tourist town of Pedernales, similar to Puerto Lopez in urban growth and social transformations, the majority of victims died due to the collapse of their houses and the hotels. The 95% of these buildings were not old, with no more than 20 years, but had been built of concrete and bricks. This fact means that the majority of these buildings have informally been constructed without considering the official norms for building with this type of materials in this specific geographical area. According to the information and evidence compiled by the Ministry of Urban Development and Housing (MIDUVI) after the earthquake, plenty of buildings and houses collapsed due to the inadequate and not technical use of the construction materials in the extreme saline environment. In structural components like columns and beams, engineers found that the steel sticks used as structure were rusted and corroded. Plenty of neighbours and native inhabitants recognised that during the tourist boom, households and hotel owners used to mix the cement with beach sand due to the high prices of the sand normally used. However, to use this type of sand, which has a large percentage of salt and other minerals that corrode the steel, has been totally forbidden by the Ecuadorian Construction Code many decades ago.

The spread of tourism in this poor rural region, as well as the deficient local urban planning, triggered an accelerating informal urban growth, characterised by the self-construction of buildings, and the empiric use of construction materials and technics. The promoted vision of a international tourism as the key to achieving a social and economic development in the towns and in the entire Spondylus region provoked a flexible interpretation of basic construction norms and the rapid expansion of informal urban growth. Directly or indirectly the new economic monoculture, within the context of an extreme underdevelopment, fuelled the increase in informal housing and the construction of buildings and consequently the exposure to natural disasters.

8.2. Rethinking urbanisation and sustainability in rural areas

The analysis of the new urban forms that have emerged in Puerto Lopez in the last two decades revealed a reality, which is hard to observe directly in the field: The urban growth of this town is not sustainable and is decreasing the capacity of resilience of the entire urban system. The new formal and informally built spaces represented by the urban forms are dichotomous regarding socio-economic development, but at the same time, both are not sustainable and resilient. This fact is the main argument openly to call for a discussion of the type and quality of urbanisation that these kinds of settlements currently experience in a globalised world.

After measuring and assessing the new urban forms, the first questions what discussing are: (1) Which are the best type of urban grain that should occupy the still free macro plots, and (2) How can the reproduction of this specific urban form be promoted. However, the complexity of urban systems, as well as the specific characteristics of the social, political, and economic context; turns this initiative into a simplistic view of the entire phenomena. Likewise, poverty and vulnerability in rural areas are the visible and measurable outcome of an economic system and the political structures that have been established since plenty of decades. Late globalisation is not the culprit, and rural areas are not the victims. After the Second World War, capitalism has been globally dominating the structure and dynamics of the international markets, and in developing countries, its consequence has been the rise of poverty and inequality (Stiglitz, 2013; Acosta, 2012; Guimaraes, 2003; Harvey, 2001).

In the case of Puerto Lopez, the questions would be:

- How could urban and territorial planning guide positive social and spatial transformations of the town within a context of globalisation?
- What do decision-makers, local actors, and citizens need to change or improve?
- Which are the challenges posed by climate change and the New Urban Agenda globally and locally?
- How would settlements like Puerto Lopez face them?

8.2.1. Tourism can be oriented to trigger positive transformations

International tourism is not an independent transformative force that simply reproduces inequality and poverty in the developing world. Plenty of examples around the world supports the *transformationalist* vein of studies about globalisation, which understand it as a human-made global phenomenon that can be guided and oriented locally to generate positive change and development (Murray & Overton, 2015).

The complex structure of scales that intertwines social, political, economic, local and global networks by globalisation is extremely dynamic and volatile regarding change (Swyngedouw, 2004). Latin America is still a group of young democracies that are politically evolving and boiling, and this reality permeates to all geographical scales, no matter how urban or rural the area could be (Acosta, 2012). Nevertheless, the conjunction of new challenges posted by climate change and oil dependency demands that the new generations of urban planners propose a more "Latin Americanised" urbanisation according to the particular complexities of their cities (Boisier, 2005).

United Nations defines urban and territorial planning as a key tool for promoting an endogenous development "Urban and territorial planning can be defined as a decision-making process aimed at realizing economic, social, cultural and environmental goals through the development of spatial visions, strategies and plans and the application of a set of policy principles, tools, institutional and participatory mechanisms and regulatory procedures" (UN-Habitat, 2015b, p. 2). Likewise, it highlights its transformative role as social and spatial positive change trigger in settlements, especially of the developing world "Urban and territorial planning have an inherent and fundamental economic function. It is a powerful instrument for reshaping the forms and duties of cities and regions to generate endogenous economic growth, prosperity and employment while addressing the needs of the most vulnerable, marginalised or underserved groups" (UN-Habitat, 2015b, p. 2).

Nowadays, the majority of the urban planning research is focused on the largest cities as the main arenas where the future of the humanity will be constructed and decided (Habitat, 2013). During the 21st century, climate change and peak oil effects (Hopkins, 2008), in addition to the increase of social inequality related to globalisation, will be the main challenges to tackle, especially for Latin American cities. Nevertheless, we forget that medium and small-size settlements also have an important role to play in this defiant future, primarily in the case of developing countries. As the result of the historical high percentage of rural families living in extreme poverty and social vulnerability, Latin American medium and small-size cities will with more intensity suffer from adverse impacts of climate change, but at the same time, they will also have also the potential to be a strategic resource in order to increase resilience.

In Ecuador, the most extreme levels of poverty and vulnerability to natural disasters are still concentrated in rural settlements (Wong, 2013). Medium and small-sized settlements are the main guardians and destroyers of the few biodiversity hotspots that still survive along coastal regions, which are essential for the improvement of the local and global resilience (Hannah & et al., 2013). Moreover, archaeological remains from pre-Hispanic civilisations, which have been covered by vegetation and soil for several centuries, are nowadays threatened by the advance of agricultural frontiers and urban borders (Lunniss, 2014).

In the developing world, the globalised market of international ecotourism has contributed to the rapid and unplanned transformation of fishing and farming villages to small globalised cities or beach resorts. This accelerated and uncontrolled rural-urban change has provoked several negative impacts to the natural environment and the socio-economic development. In the specific case of Latin America, there are plenty of examples in the Caribbean region (*Punta Cana, Puerto Plata, Bahía de las Águilas,* in Dominican Republic, or *Ocho Ríos* in Jamaica), in the Central American countries (*Cancún, Acapulco*, in Mexico, or *Manuel Antonio* in Costa Rica) and along the tropical South American coastlines (*San Andrés* Island, in Colombia or *Santa Marta* in Venezuela) (Telfer & Sharpley, 2008; Britton, 1982).

The southern Spondylus Route region (SSRR) can definitively face it. The two essential ingredients are the huge global demand of ecotourism in pristine tropical landscapes and the requirement of economic and social development in this type of places. What is needed is a strong, but flexible local platform of governance that functions as a bridge, filter, and connector between the huge global network of transformative forces called globalisation and the local priorities of balanced development and endogenous growth. From both sides, there is an offer and demand.

This task is per default assigned to the national government. Particularly, in rural areas where small municipalities deal with the lack of economic resources, infrastructure, and specialised staff, the roles of the state and private sectors are indispensable (Barton et al., 2013). Nevertheless, what is also needed is to involve local actors who could guarantee that the process of change would be positive for all, including the natural environment. Participatory processes are vital for the successful construction of regional and urban planning tools, programs, and projects. With a consolidated democratic platform, the dream of guiding and controlling actual processes of change with a clearer knowledge about collateral effects will be possible. Investing economic and human resources in building a cohesive local community is the first step to prepare this base, and many others, to anchor connectors between local and global scales (Murray & Overton, 2015; Boisier, 2005).

8.2.2. What do we need to change or to improve locally?

Poverty, inequality, and vulnerability, constrain any possibility to implement deep changes. Despite the temporal economic growth that the expanding of a new economic activity could trigger locally, the old and new generations of inhabitants drag with themselves serious limitations regarding education, and specialised skills, that could allow them to spring between scales locally and even globally. The unequal access to education and the priority of working in early life are the most common reasons for the high levels of drop-outs in schools. Even other root social problems, like corruption, delinquency, or violence, are directly or indirectly related to the inequality in the access to opportunities of growing personally and professionally. Many generations of rural families accepted their destiny without any other possibility, and many others take the wrong way despite knowing the legal consequences, or as a way of walking against the direction of an unfair and ruthless economic, social, and political system.

We need sustainable urban planning and urban design in settlements like Puerto Lopez, but moreover we have to promote the building of a strong cohesive community with a proper local identity related closely to its landscape and traditional ways of life. Without the human factor inside, any equation would be unusable. The last social and spatial transformations experienced by Puerto Lopez and by many other cities in the world show it clearly. Deep changes could not be imposed by urban planning or by scientific studies. A real positive transformation should discuss first what is positive what is negative for the local community, its natural environment and the following generations of citizens. Nowadays, there is no discussion that the most important object of study to positive change, if we want to preserve our global resources, is the ways of life in developed as well as developing countries. However, urban planners, decision-makers, academia, and other actors addressing the dilemma of development in distinct spheres of discussion have to understand that the most efficient form of changing ways of life is a process of self-transformation of the communities.

Definitively, what we do not need is to repeat old discourses or reformulate old-efficient formulas. To achieve a real change in cases like Puerto Lopez, we have to propel entirely different actions, and new innovative proposals should be tested. Local initiatives of bottom-up transformation like *Transition towns* are required. However, as it was mentioned above, the developing world has to find its answers and has to express its proposals.

8.2.3. The New Urban Agenda 2030: global-local challenges

The New Urban Agenda 2015-2030, like the old 2001-2015 one, means a huge hope of achieving global and local developments again. The new Sustainable Development Goals (SDGs) replaced the old Millennium Development Goals (MDGs), and indicators were updated to measure and monitor more efficiently the advances in the development of regions, countries, and cities around the world. The challenges are huge, but the optimism is higher. Nevertheless, after observing the marginal advance experienced by cities in rural regions like Puerto Lopez, despite the global promotion of the new urban agenda, this initial optimism turns immediately into scepticism.

Why did the last urban agenda not reach these remote scales and geographies? Was it a problem of physical distances? But how could it be possible that this emerging tourist destination could be isolated in sustainable development when at the same time it had been progressively included in the global network of international tourism? After more than two decades since the term globalisation emerged in the scientific discussion, plenty of different scientific and empiric arguments could answer these questions. However, what is for sure a verified fact is that the last urban agenda was not efficient, and development has not been triggered in several places of the globalised world.

That is why sustainable urban planning applied in Ecuador should consider seriously the past experiences of the first urban agenda before engaging in the new one. It is indispensable for our country and poor regions to link the territorial and urban planning with this global agreement and commitments of change. But the most important objective should be not forgotten; we have to be realistic and have to recognise that eradicating poverty is a long-term process that cannot be isolated from the current global economic system and from the predominant consumerist ways of life as well. In this task, the national government plays a decision-making role. As a country, we need mature political agents, and even elites, who actually represent the interests of all the citizens. Definitively, the New Urban Agenda is a good first step to defining where we are, and how much we still have to improve on the way we are planning cities in Ecuador. However, the root problems are still inside us and the mechanic of reproducing poverty and inequality (Acosta, 2012).

Moreover, the recent earthquake in the Ecuadorian coastal region was an even more painful incident that revealed the lack of resilience and the excess of exposure in our still poor rural settlements. There are valuable lessons to be learned from these tragedies. They are a challenge for various local and international agents who day by day and, directly or indirectly contribute to build and rebuild cities and communities as a social construct. We need to rethink urgently how we are planning and building our cities in developing countries, especially due to the

increase of natural disasters related to climate change. Nowadays, we have the opportunity to plan *the cities that we need* in Latin America. Our contemporary vulnerable towns could be the resilient cities of tomorrow.

This year, Ecuador will be the host of the Habitat 3 global conference where the new urban agenda will be defined. The cards are on the table: How could sustainable town planning and the New Urban Agenda contribute to change this reality? Is it possible to plan resilient cities in the developing world? Why did the past urban agenda not work in these territories? The successful implementation of the New Urban Agenda 2030 in developed and developing countries will be one of the most important challenges to be faced by local and global stakeholders in the following decades.

After officially adopting the New Urban Agenda in the world conference Habitat 3 in Quito, each country will apply this challenge locally, but with a comprehensive view of common adaptation to the effects of climate change and to the same processes of urbanization and globalization. The task is not easy, and it will locally require the improvement of the communication and the transfer of knowledge between stakeholders and globally between the developed and the developing countries in order to bridge gaps and break barriers.

On the one hand, the scientific and academic community in the advanced and developing countries like Germany and Ecuador will be strategic stakeholders to foster and monitor the implementation of the New Urban Agenda locally. Particularly, in national and sub-national scales its role will be needed to promote and build bridges of communication between decision-makers and citizens with an objective and ethical commitment in polarized countries of Latin America like Ecuador.

On the other hand, academia has the experience and potential to support and foster the global knowledge between countries and regions around the world. Historical gaps of global inequalities in technological development, scientific research, and quality of life in cities between developed and developing worlds could be reduced by the contribution of academia. Despite the fact that globalization has been contributing to reducing distances and times in terms of global communication between regions, a decrease of social inequalities, of poverty and vulnerability have not been achieved.

The scientific and academic communities in each country and city around the world have the ethical and moral commitment to fortify their role as local and global bridges of communication to transfer knowledge. The generation and publishing of scientific research and new information will be crucial for the efficient implementation and monitoring of the New Urban Agenda 2030, especially in developing countries and vulnerable regions. Likewise, without the technical

support of institutions and academia in the developed countries, this task will not be affordable for all the poor communities.

Section D: Conclusion

9. Conclusion and recommendations

As it has been outlined in the research question of the beginning, the study aimed to contribute to the understanding of the nature (causes and effects) of the social and spatial transformations exhibited in the Spondylus region and particularly in Puerto Lopez since the arrival of tourism. Six new urban forms have been demarcated, characterised, and measured in terms of sustainability in order to identify disparities of urban growth and their contribution to the destruction of the natural and archaeological heritage. Likewise, the transformation of Puerto Lopez into a tourist coastal town over the last two decades has been described and represented by a *scheme of urban growth by urban forms* grounded on both statistical data and orthophotos. This scheme, based on the *model of seaside resort formation* from Smith (1991), opened the door to the exploration of positive and negative scenarios of urban growth. As a result, a method of observing and evaluating the quality of urban growth (socio-spatial transformations), by studying the urban morphology of this type of settlements, was constructed.

The analysis was presented in thematic maps, which allow observing the social and spatial fragmentation of this urban area as well as the rise of social inequality concerning the access to essential services and affordable land. This evidence corroborates the hypothesis of the transformationalist vein of globalisation studies (Murray, 2006) which addresses these phenomena as adverse effects of globalisation in territories of the developing world. But at the same time, it is also possible to realise that globalisation might be controllable to the extent that decision makers and even citizens understand more clearly its transformative nature (causes and effects) in order to take better and wiser decisions at the right time (Beland, 2010).

The urban growth of Puerto Lopez has neither been sustainable nor resilient. The analysis of the transformations in the built and social environments shows that the decrease of poverty and vulnerability has been marginal and that social inequalities have been increased. Consequently, in low income neighbourhoods, the exposure to natural disasters is higher due to the adverse conditions of houses. To some extent, these outcomes had been expected, especially due to the traditional elevated levels of poverty in the Ecuadorian rural areas (Wong, 2013). However, the study of the new urban forms revealed more details and specific knowledge about the disparities in these changes and the impacts on the natural environment.

The following conclusions were extracted from the five previous core chapters, which are organised in a scalar sequence, from the global and regional in a first part (Chapters 4 and 5) to the urban and urban-sectoral in the second (Chapters 6, 7, and 8).

9.1. Correlations between tourism and the socio-spatial transformations

The first conclusion is that there are clear connections between the socio-spatial transformations that have been taken place in Puerto Lopez from 1990 until to the present, and the rising of tourism as one of the most important economic activity during the same period. By overlapping statistical and geographical information of the years 1990, 2001, and 2010, thematic maps about the evolution of the social and built spaces in urban sectors have been elaborated in Chapter 6. In turn, this information is contrasted with the narrative of local actors compiled by semi-structured interviews in 2013 and 2015 (Pozo, et al., 2014).

The main argument relies on the high population growth rates experienced by Puerto Lopez in the periods 1990-2001 and 2001-2010, which were even greater than the national average. While other similar poor towns located in the same region experienced depopulation due to rural-urban migration, Puerto Lopez has been a receptor of population flows (Wong, 2013; IGM, 2013, p. 50). The accelerated rise of tourism as one of the most significant local economic activities exacerbated the informal labour market, and many families from the surrounded rural settlements have been attracted to migrate to and settle in Puerto Lopez. The main attractions are the opportunity to find a new job in this informal market and the access to public services like education and health (GAD Municipal Puerto López, 2015).

The local labour market and the economic activities experienced changes as well. The construction of hotels, hostels, lodges, and hosterias triggered the emerging of formal and informal secondary and tertiary economic activities directly or indirectly related to tourism. Especially, complementary services like retails, restaurants, souvenir shops, transport, tourism operators, were incremented year by year and provided formal and informal jobs for many unskilled workers. Likewise, the predominance of informality supported the spreading of diverse products related to beach tourism being traded on the streets (Pozo et al., 2014).

Plenty of native families that had based their incomes and consumption habits on artisanal fishing and farming changed them partially to be inserted in the local tourism market (Harris et al., 2004). Some visible examples of this new dynamic are identified: (1) New generations of fishermen adapted their fishing boats to make tourist motorboat trips to transport visitors to observe the humpback whales; (2) families living in downtown constructed one or two new floors in their houses to provide cheap accommodation for backpackers or to rent the ground floor for retailing, local tourism agencies, restaurants, and others (Pozo et al., 2014). These social transformations were reflected by the new process of rapid urbanisation experienced by Puerto Lopez. For the last 25 years, the urban limit of Puerto Lopez was formally extended three times, which meant an increase of almost the double of the original urban surface of 1990 (INEC, 2010; INEC, 1990). This urban growth is characterised by the densification and

parcelling of the downtown and fringe belt as well as the low-density expansion deployed in the northern and eastern hilly peripheries.

Even if there had been building land inside the urban limit in 1990 and 2001, the external natural landscape was bulldozed and settled by low income housing. As an outcome, in 2010 there were plenty of macro plots still not occupied but legally demarcated. They summed up to a total area of 113 hectares, which meant almost the 35% of the entire urban area. Even though the urban expansion has been relatively slow regarding constructing of houses, the demarcation and parcelling of macro plots and plots have accelerated, particularly in the peripheries.

Nowadays, the local government faces the challenge of providing them with electricity, potable piped water, a sewage system, solid waste collection, and asphalted streets. According to the municipality of Puerto Lopez, in 2015 around the 46.16% (3,331) of the total number of the demarcated plots (7,216) are still not registered on the public record[42]. This official data represents unquestionable evidence that in the last decade a high percentage of the urban growth of Puerto Lopez has informally expanded and parcelled.

The local government has been addressing this dynamic of informal urban growth by a program of legalising the plots. In 2016, on the occasion of an annual official event, the Vice Major of Puerto Lopez proudly described how this program initiated by the municipality has been advancing slowly, but efficiently. The outcome was that 10% of these plots are now legalised, and their owners can access basic services and social housing subsidies provided by the national government. However, the main problem lies on its spiral escalation reflected in the urbanisation. The progressive legalisation of plots and houses could be indirectly fostering the increment of informal urban expansion. While the municipality is legalising plots, new other ones are going to be demarcated and settled by informal dwellers and land dealers or *traficantes de tierras*. This social project could be attracting new rural migrant families, who will settle in peripheral not-occupied areas, with the self-confidence that over the course of time their plots and houses will be legally accepted. The old vicious circle of *land in return for votes* that fuelled the informal expansion of Guayaquil in the 1950s is being replied in Puerto Lopez.

This type of "informal-formal" urban growth might be propelling the low-density expansion and the emerging of slums. This supposition cannot be officially proved due to the fact that any municipality would directly accept that it is using this program of legalising plots as a way to achieve votes from a massive majority of poor families, which would mean the open recognition of the practice of a spoils system. Nevertheless, these examples show that the local government has had an important responsibility on the current quality of the informal urban expansion.

[42] Video: *Objetivo y meta administración 2014-2015*. Source: http://www.puertolopez.gob.ec/multimedia/

9.2. The urban growth has not been sustainable

The second conclusion is that the urban growth of Puerto Lopez has not been sustainable for the last decades. This affirmation is based on the results obtained by assessing the evolution of sustainability in two periods (1990-2001 and 2001-2010) by urban indicators presented in Chapter 6 (United Nations, 2004). The majority of the urban sectors experienced only a weak decrease, or even no decrease, of the variables measuring of urban sustainability and resilience. Particularly, the extreme levels of poverty, the limited access to basic services, and the exposure to natural disasters due to the predominance of houses in adverse conditions are the current evidence of an informal and uncontrolled urban growth in the peripheries as well as in the downtown and fringe belt of Puerto Lopez. This conclusion contributes to demystify the erroneous popularised assumption that just the arrival of international tourism would be the key to achieving social and economic development. There are other local and regional agents, who have an important role to play to achieve development.

Similarly, disparities in the access to essential services and to affordable land were identified. These observations corroborated the initial suspicions that the urban growth of Puerto Lopez has not been a socially equal one despite the revitalization of the local and regional economy propelled by tourism. The clearest evidence can be observed in maps, where the private tourist infrastructure is located in the best quality of land, while low income housing is settled in the risky and hilly peripheries.

Globalisation, represented in this case by tourism, could be understood as the earthquake that provoked the "urbanisation tsunami" or urban expansion that has been destroying the natural and archaeological heritage. However, the main responsibility for controlling or guiding the urban growth of the city officially falls to the local government, to the decision-makers, and to the same citizens that did not become aware of the long-term consequences of this type of urban growth. The short-term vision of building a *modern city* and achieving *modern development* might keep them blind and probably made them forget the most important priorities required for the improvement of the spatial quality and the life in their city and neighbourhoods.

Poverty is a complex macro phenomenon that cannot be tackled just locally. The national government leads it by the construction of public policies and the implementation of social programs and projects that permeate into the different scales of the territory. Even though, the way how cities grow and how the quality of this growth contributes to increasing or decrease social problems is the responsibility and legal competency of local governments.

9.3. Social and spatial fragmentation of the urban area

A third conclusion identified was that the 2010 urban area of Puerto Lopez is fragmented, socially and physically. This affirmation is supported by the outcomes obtained by the process of identifying and characterising the urban grains and urban forms. By codifying the urban grains of blocks and plot grids, six urban forms were demarcated and analysed. They are entirely new and different from the urban forms which were predominant before 1990 and which corresponded to a fishing village.

The natural transformation of Puerto Lopez from a fishing village into a small globalised beach resort produced new types of formal and informal urban growth. Urban sprawl expanded formally and informally to the peripheries. The urban forms that have developed thereby allow the reading of the disparities that accompanied the urban growth since the arrival of tourism; but moreover, they are the tangible and measurable evidence of the social and spatial fragmentation of the urban area.

The disparity concerning the access to affordable land and essential services between the private tourist infrastructure and the low income housing is the best example to observe the widening of the inequality gap. Likewise, different levels of exposure defined by the physical condition of houses become apparent when these two urban forms are compared. In 2010, urban forms with a predominance of low income housing had a high percentage of houses with walls, roofs and floors in bad conditions. By overlapping the predominance of houses in bad conditions with their location in dangerous areas, areas of extreme levels of exposure could be identified and demarcated.

Due to the high prices of the land located along the beach or in the tourist downtown, poor migrant families or new generations of natives can only afford the informal land localised in the hilly peripheries. In these areas, the quality of the soil is only marginal, and there are no public networks of essential services. Likewise, low income families can not afford to initially build their houses with modern and permanent construction materials like bricks and concrete. In an initial stage, houses are usually made of bamboo or wood but are progressively improved.

Informality also has been present in the construction of houses in low income neighbourhoods. The majority of the houses have been self-constructed, but with diverse types of qualities. The last natural disaster, a 7.8 grades earthquake, revealed these deficiencies in the design and construction of the houses and buildings along the Spondylus Route. After this tragedy, the immediate reaction of the national government was to audit and question the constructive quality of the houses and buildings that had collapsed. However, the root of the problem was not discussed, which is the form of how these towns and cities have informally grown over the last decades.

Despite the fact that this natural disaster is too recent to make definitive conclusions, some suspicions could be explored. The deficient quality of construction in low income neighbourhoods in Ecuadorian and Latin American cities has been studied since the middle of the last century. The rural-urban migration of the 1950s and the increase of inequality in urban areas in the 1990s fuelled the formation of huge patches of slums *(favelas, barriadas, villas miseria, or invasiones)* in cities (United Nations, 2014a; De Mattos, 2010).

Likewise, Latin American rural and urban areas have experienced diverse types of natural disasters with different magnitudes of destruction in the last century. The fact that countries like Ecuador live in a constant hazard of being impacted by floods, landslides, earthquakes, tsunamis, or volcanic eruptions is not new. There are plenty of examples of towns, cities, and even regions affected by these tragedies in Ecuador and many other countries with the same high levels of exposure and poverty (CEPAL, 2012; Silva Lira, 2003).

As this type of informal urbanisation and its elevated levels of exposure are not new for Latin American governments, stakeholders, and even citizens; the post-disaster questions should be reformulated: Why did the last lessons learned by Latin America about informal low income housing did not arrive in this region? What happened in the case of small cities like Puerto Lopez? The most probable answer stated by local governments might be that informal urban expansion is an uncontrollable phenomenon which small cities cannot efficiently address due to its social complexity and velocity. In other words, massive poverty and the demand for affordable land in the towns cannot be planned.

Nevertheless, there should be lessons learned from the different experiences in many similar countries, with similar urban growths, problems, and challenges. The New Urban Agenda 2030 represents the freshest hope regarding unifying efforts to insert resilience in the urban planning practice of developing countries. The imminent increment of natural disasters related to climate change has forced governments to rethink the way that settlements, no matter size or hierarchy, have been planned and might be scheduled for the following decades to decrease vulnerabilities, exposure, and poverty (United Nations, 2016; World Bank, 2015).

9.4. Constructing a scheme of urban growth and a method to understand it

As an outcome of searching efficient forms to understand the nature of the social and spatial transformations experienced in Puerto Lopez, a scheme of urban growth and a new method to measure its quality have been designed and constructed. The first is defined as the conclusion of Chapter 6, where the transformations of Puerto Lopez are presented by maps and statistical information. The latter is designed and implemented in Chapter 7 to identify the new urban forms, and subsequently describe and measure their levels of fragmentation and sustainability. Finally, both sources of information about the social and spatial transformations experienced by Puerto Lopez are integrated into Chapter 8 to food the discussion and analysis. Both, the scheme of urban growth and the method to evaluate it, have a theoretical ground based on previous scientific research about globalisation, international tourism, and urban morphology.

On the one hand, the *model of beach resort formation* (Smith, 1991 in Williams, 2009) has been adapted to the case study of Puerto Lopez and used as a scheme to observe its evolution. Both, the original model and the proposed scheme, are extremely important to understand the basic structure and the content of an international beach resort and how it previously was transformed from a coastal settlement into a globalised tourist destination.

On the other hand, the method of identifying the urban grains in Puerto Lopez is based on the study of the urban forms developed by the urban morphology discipline in the last decades (Conzen, 2004). Especially, the legacy of townscape analysis initiated by M.R.G Conzen since the first middle of the 20th century and its subsequent development by authors like Whitehand, Kropf, and many others; was combined with GIS as a tool to identify similarities, disparities, and the predominance of social and spatial features that define each urban form (Gauthiez, 2004).

Likewise, an essential reference initially consulted to set a practical method to observe and measure urban growth, is the study published by Wheeler (2008) *The Evolution of Built Landscapes in Metropolitan Regions*. He identified newly emerged urban forms related to globalisation by combining urban morphology and GIS. His method to analyse the evolution of urban surfaces by comparing historical orthophotos and maps with land use patterns and statistics, was an inspiring methodological reference which demonstrates that urban forms related to globalisation can be identified and evaluated (Wheeler, 2008).

Constructing and adapting this method, originally designed for studies about the morphogenesis of European and American cities, for being applied in towns and cities of the developing world is also an important outcome and a challenge at the same time. In addition to the differences of contexts, the lack of historical and statistical information is a factor that could limit the advance of these types of studies in developing countries. However, this study demonstrates that it is

possible to build a basic, but consistent description of the urban growth and transformations of an urban area by combining diverse types of disciplines and tools (Gauthier & Gilliland, 2006).

The case of Puerto Lopez is similar to many other towns and cities of the developing world, where the historical and archaeological references are extremely poor due to the lack of continuity in research and the absence of statistics differentiated into micro urban scales, particularly in rural regions. Nevertheless, the scheme and method built for this research could be used as an example to be applied and incorporated in the urban and territorial planning tools of Ecuador and many other countries of the developing world that are experiencing similar processes of urbanisation.

It results clear that a rigorous scientific method for studying and assessing the urban growth of towns and cities is necessary to be included in the urban and territorial planning of the Spondylus region. Academia and the scientific community could fulfil this demand by the developing of new research as well as methods to observe, measure, guide, and monitor the way that territories are transforming. Likewise, local governments, decision makers, citizens, and the private sector should participate actively in these initiatives and proposals. The ATP program is an optimal opportunity to activate local public participation and social activism in order to promote and popularise a sustainable urban development as the best option to plan the future and preserve the natural and historical heritage (Pozo et al., 2014).

9.5. International tourism in Ecuador: a miracle or a new dependency?

The question if tourism could be a miracle to achieve local development or if it is a new dependency that would constrain it, is still difficult to answer. From an *anti-globalization* or *sceptic* point of view, it is a grave threat to traditional ways of life as well as to the natural environment (Murray & Overton, 2015; Britton, 1981). From a *transformationalist* point of view, this human-created phenomenon called globalisation (represented here by international tourism) might be controlled and reoriented to promote equality and prosperity for all (Murray & Overton, 2015).

However, there are observations of the past and current tendency that should seriously be considered. Tourism has not been an economic miracle along the Spondylus Route, but definitively it will continue spreading and increasing for the following decades. Particularly, the last assumption means that the process of transformation of tourist coastal towns and cities like Puerto Lopez might be accelerating. It is clear that the degree which international tourism or any other globalised force, transforms these territories will depend on the way in which local communities and urban planning are prepared to guide it or to react towards it (Boisier, 2005). That is why it is necessary to rethink the way these settlements are planned by and how they physically grow. Informal urban growth is not sustainable and will exponentially multiply the public and private expenses to afford sustainable urbanisation (United Nations, 2016). By continuing with this scheme of growth, a dark scenario of the survival of natural and archaeological heritage will become apparent.

The current national government has been promoting Puerto Lopez and the Spondylus region as an international tourist destination (MINTUR, 2007). Amazing pictures of their natural landscapes could be discovered in web pages like *TripAdvisor*, *Booking.com*, *Lonely Planet*, and many others. However, without a deeper knowledge of the processes of social and spatial transformations experienced by these towns and small cities, the price of any initiative to reactivate economic development would be paid by the natural landscape, biodiversity, and all the archaeological remains destroyed by informal and formal unsustainable urbanisation.

Likewise, the growth of the local market might be affected by the lack of credibility and competitiveness on the global market of tourism due to the deficient quality of the urban spaces and public services, but moreover because of the destruction of the natural landscape, which is the main product requested by the international ecotourism. A low number of international tourists visiting the Spondylus Route mean also low incomes. Domestic tourists as well as backpacker tourists, do not spend so much money on tourism services as foreigners (MINTUR, 2011; Prieto, 2011).

Finally, within a context of a networked market, there is the imminent risk that the Spondylus region could be internationally identified as a "low-quality tourist destination", where tourists arrive expecting to enjoy pristine natural landscapes and traditional ways of life by the practice of real ecotourism, but they find a poor quality of the built and natural spaces. If Puerto Lopez and other local destinations really want to be part of the global network of tourist flows, these limitations should be faced and overcome urgently. It is impossible for Ecuador to regionally compete against traditional international tourism receptors like Peru, Colombia, Venezuela, Costa Rica, or Panama without building a local and international prestige grounded on the quality of its built and natural assets (Prieto, 2011).

Without a well-prepared sustainable and resilient local urban planning, the incidence of tourism or any other future globalised economic force will trigger a process of self-destruction indirectly guided by the same local governance, stakeholders, and citizens. As it has previously been discussed by the preceding arguments, no matter how transformative any globalised external force could be, the local response will be always decisive and determinant in the construction of its own sustainable future (Boisier, 2005). In the case of Puerto Lopez, and plenty of other tourist coastal towns and cities along the Spondylus Route, international tourism might not be discussed as either a miracle or a new dependency. It should be addressed as an opportunity and a chance to be planned locally and constructed wisely in order to improve the future of the following global and local generations (UN-WTO, 2012).

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Glossary

Epistemology: "Concerned with defining the knowledge and explaining how it works. While ontology attempts to account for what is in the world, epistemology asks how it is possible to know the world. Although often considered in tandem, particularly in describing the constituent elements of a body of thought, ontology and epistemology more properly should be thought of as overlapping, as there may be elements of 'what is' that are not knowable, and knowledge may contain ideas that do not correspond to existing things in the world. Their conceptual complications were made most explicit during the epistemological 'turn' in the humanities and social sciences, which was inspired by the linguistic 'turn' developed under the post-structuralism of Michel Foucault, Jacques Derrida and Judith Butler, among others. These connected movements rejected Platonic epistemology, which took knowledge to be innate and discoverable by profound illumination, and made it the product of circulating discourses and dispersed power relations, which were naturalised over time through their popular uptake and transformation into common notions (see hegemony). Among the political consequences of this take on knowledge was a dethroning of the notion of Truth, particularly in its a priori, universal articulation, as the lofty goal of all acts of knowing" (Gregory et al., 2009, p. 206).

Landscape: "A cardinal term of human geography, the landscape has served as a central object of investigation, organising principle and interpretative lens for several different generations of researchers. Through periods of both ascendancy and eclipse, landscape´s constancy lies in its function as a locus for geographical research into culture – nature and subject – object relations" (Gregory et.al, 2009, p. 409).

Morphogenesis: "The study of the change in form over time. The term derives from developmental biology, and it sometimes used as a synonym for positive feedback in systems analysis (see also complexity theory). Its most developed use in Human Geography to date has been in studies of landscape change in historical geography" (Gregory et al., 2009: 480).

Morphology: "Form or the study of form" (Gregory et al., 2009: 480).

Nature: "The essence or defining the property of something" (Gregory et al., 2009, p. 492).

Ontology: "The study and description of 'being', or that which can be said to exist in the world (cf. epistemology). Although ontology has many definitions and approaches in philosophy and in geography, it tends to be formulated by considering interactions between the world-as-it-is and ideas or conceptions about the world. Western thought has been greatly influenced by the classical, formal ontology of essences, exemplified by Plato's Ideals (where objects in the world are imperfect copies of ideal forms) and Aristotle's categories (where all such forms emerge inductively out of the stuff of the world). The concern with ontology in the natural sciences and

the human sciences typically focuses less on the general conditions of existence than on the objects, relations and concepts serving as the foci of their specific disciplines. In this vein, the main ontological hobbyhorses in human geography have included the character of the relations between society and nature, and concepts of place and space" (Gregory et al., 2009, p. 511).

Resilience (1): "Is a complex and dynamic system-based concept used differently in a variety of disciplines, and also a simple concept referring to the ability of a system to return to a previous or improved set of dynamics following a shock. It also refers to the potential for individuals, communities, and ecosystems to prevent, absorb, accommodate, and recover from a range of shocks and stresses. At the urban scale, resilience requires investment in both man-made and nature-based 'hard' infrastructures, as well as 'soft' systems such as knowledge and institutions. The concept of resilience, when applied effectively, can provide a useful base for more substantial changes in the underlying social, political and economic drivers of risk and vulnerability. Factors that influence the resilience of cities include their organisational structures, functions, physical entities, and spatial scales. A resilient system can continually survive, adapt and grow in the face of resource challenges and disturbances in an integrated and holistic manner for the well-being of the individual and collective. Those challenges and disturbances may be discrete and temporary, such as a natural disaster, or endure over a longer period, such as a shift in climate conditions or change in the availability of key resources" (UN-Habitat, 2016b, p. 32).

Resilience (2): "The ability of a system, from individual people to whole economies, to hold together and maintains their ability to function in the face of change and shocks from the outside" (Hopkins, 2008, p. 12).

Systems thinking: "Replaces linear and positivist directions in urban and reinforces the primacy of the relationship between elements and the flow of materials and energy rather than individual elements. The natural, physical, human, cultural, and social environments are linked in systems thinking. It recognises interdependencies and interconnections between policies and actions, achieving multiple benefits in outcomes that address multiple issues" (UN-Habitat, 2016b, p. 32).

Townscape: "The observable units of urban form that can be mapped and classified" (Gregory et al., 2009).

Urban ecology: "Is the systems-based understanding of biotic and physical elements that occur in urban areas. It recognises the interaction between natural systems and social and cultural systems, among others. Urban ecology places particular importance on the primacy of natural systems in contributing to livelihoods, well-being and resilience, and focusses on the interdependence of key resources (usually water, waste, and energy) and their impact on city

development. In Policy Unit 8, the term sustainable urban development refers to the normative outcome of policies and actions related to the urban ecology, where "sustainable" is defined as the state wherein natural systems function, remain diverse and enable the ecosystem to remain in balance" (UN-Habitat, 2016b, p. 32).

Urban geography (1): "The geographical study of urban spaces and urban ways of being" (Gregory et al., 2009, p. 784).

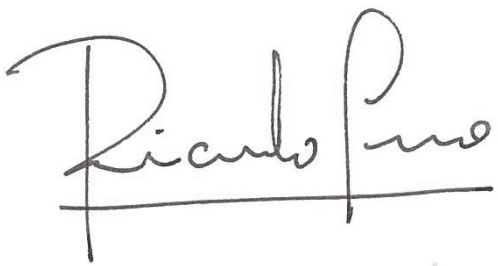
Urban geography (2): "Urban geography is, largely, what geographers do. While this might not be a very helpful point it does reflect the subject's lack of precise definition. However, it is possible recognise a number of concerns common to many geographers. These concerns can be summarised as being of three types. *Descriptive concerns* involve the recognition and description of the internal structure of urban areas and the processes operating within them or the relations between urban areas. *Interpretative concerns* involve the examination of the different ways in which people understand and react to these patterns and processes and the bases that these interpretations provide for human action. *Explanatory concerns* seek to elucidate the origins of these patterns and processes. This involves an examination of both general social processes and their different manifestations under particular local circumstances" (Short, 1984 in Hall T. , 1998, p. 18)

Urban Morphology (1): "The study of the urban form and of the processes and persons that shape it" (Vilagrasa, 1991, p. 3).

Urban Morphology (2): "Urban Morphology is the study of the city as human habitat. They (urban morphologists) analyse a city's evolution from its formative years to its subsequent transformations, identifying and dissecting its various components. Urban morphologists focus on the tangible results of social and economic forces: the study the outcomes of ideas and intentions as they take shape on the ground and mould our cities" (Vernez Moudon, 1997, p. 3).

Statutory declaration

Hereby, I declare that I developed and wrote the enclosed dissertation completely by myself, and did not use sources or means without declaration in the text. All thoughts from others or literal quotations are clearly marked. This dissertation was not used in the same, or in similar versions, to achieve an academic grading or to be published elsewhere.



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Essen, 24 April 2017